THIRD SERIES VOL 63 NUMBER 12 OCTOBER 1956

THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

66 PORTLAND PLACE LONDON W1 · TWO SHILLINGS AND SIXPENCE

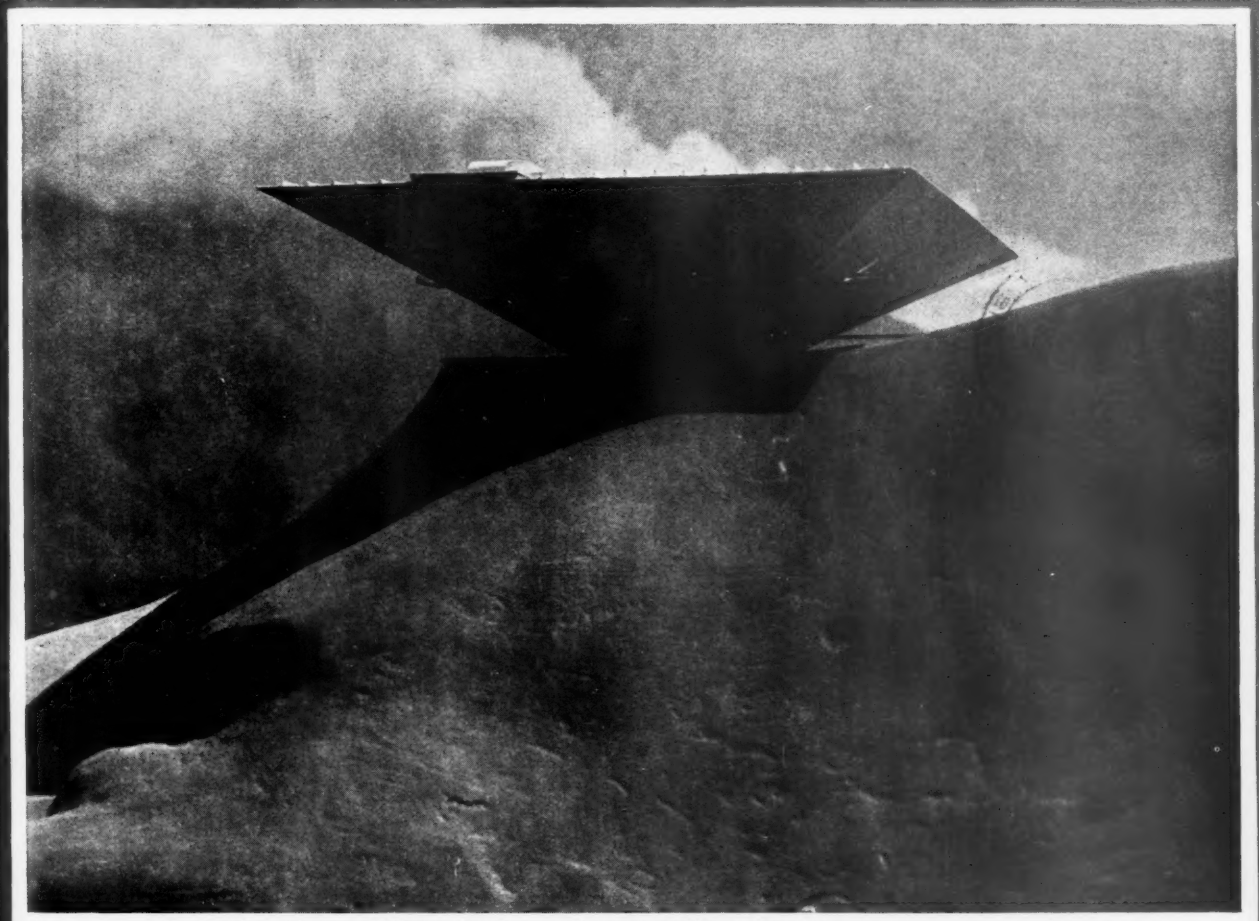


Photo-montage of project for a Museum of Modern Art, Caracas, Venezuela. Architect: Oscar Niemeyer

THE JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS

THIRD SERIES VOLUME SIXTY-THREE NUMBER TWELVE TWO SHILLINGS AND SIXPENCE
66 PORTLAND PLACE LONDON W1 TELEPHONE LANGHAM 5721–7 TELEGRAMS: RIBAZO WESDO LONDON

OCTOBER, 1956

December Exhibition

An exhibition with the title 'Architectural Treasures of Czechoslovakia' is being brought to this country by the Czechoslovak Embassy. It has been prepared and sponsored by the Czechoslovak Ministry of Education and Culture and will be shown at the R.I.B.A. during December. The exhibition is in the form of panels of photographs of the most treasured buildings ranging from the earliest romanesque to architecture of the late 18th century.

Examples of contemporary work are not included, the emphasis being on the historical styles which are being carefully preserved. About 200 castles and mansions are open to the public or have been placed at the disposal of artistic and scientific institutions.

Sessional Paper

On 19 February Dr. Nikolaus Pevsner [*Hon. A*] will give a paper on 'Architecture and William Morris' in place of that on 'Information for the Architect' cancelled owing to the death of Mr. Michael Ventris [*A*].

Great Maytham Preserved

The problem of what to do with architectural white elephants involves buildings nearer and nearer to our own time now that the threat to Great Maytham has led to the Kent County Council making a preservation order to prevent it being 'demolished, altered or extended without the Council's permission'.

'The reasons for making the Order', states the Council, 'are that Great Maytham and the Gate House form a very fine architectural composition designed by Sir Edwin Lutyens in 1910 in the early Georgian tradition of the earlier house on the site on which Great Maytham stands and part of which it incorporates. The character of the composition is such as to merit preservation.

'It is understood that the buildings have recently been acquired by a firm of demolition contractors and the object of the Order is to prevent the demolition of the buildings and to enable control to be exercised over any alterations likely to affect their character.'

In his *Life of Sir Edwin Lutyens*, Mr. Christopher Hussey [*Hon. A*] writes, 'Lutyens never used multi-coloured brick to better effect than in this blue-grey and purple house with crimson quoins. But for all its dignity and noble chimneys I find the result a little dull'.

At the time of going to press the order had yet to be confirmed by the Minister of Housing and Local Government.

The Garden Controversy

One of the talking points in arguments on housing density has been the relative productivity of gardens and farmland. In typical suburban development the house itself occupies only one-fifth of the plot of land.

To many planners the prospect of the increasing encroachment of house-building on farmland has been a nightmare. Wye College in its Report No. 2, Studies in Rural Land Use, 'The Garden Controversy' published by the Department of Agricultural Economics, gives a critical analysis of the evidence and arguments relating to the production of food from gardens and farmland. The findings are that 'if the "average" housing estate, with only about 14 per cent of its area cultivated, is compared with "better than average" farmland (the type of land that is most likely to be taken for development) the value of output to the nation is found to be roughly the same in both cases, when allowance is made for the saving in distributive costs which results from growing food domestically instead of on the farm'.

The report says that it may be conceivably desirable to increase housing densities for financial, architectural or social reasons, but if this is so the arguments for the proposition should be made to stand on their own merit.

R.A.I.A. Convention 1957

Should any members be making plans to visit Australia next spring they might like to know that they would be welcome to join their professional colleagues of the Royal Australian Institute at their Annual Convention which is being held at Melbourne from 1–6 April.

During the Convention, as with us, papers of general interest are read, and matters of interest to the profession are discussed and investigated. There is no doubt that an exchange of information would be of mutual value.

The invitation to attend the Convention has been officially extended by the Secretary R.A.I.A. on behalf of his Council and holds good also for 1958 when the Convention will be held in Perth, Western Australia.

Dr. Leslie Martin

Dr. Leslie Martin, Vice-President R.I.B.A., Professor of Architecture at Cambridge, is now M.A.(Cantab.). He has also been elected a Fellow of Jesus College.

Council Matters

The Council met on 9 October, the President, Mr. Kenneth M. B. Cross, in the Chair. The Council received with appreciation the presentation from Mr. G. Grey Wornum [*F*] of the silver trowel which had been used by Lord Howard de Walden for the laying of the foundation stone of the R.I.B.A. Building in 1933. Thanks were also conveyed to the Council of the Architects' Benevolent Society for the presentation of two cut glass decanters which were presented in recognition of the kindness and generosity of the Royal Institute towards the Society.

The Council gave formal approval to the award made by the jury of the Nottingham, Derby and Lincoln Society of Architects of the R.I.B.A. Architecture Bronze Medal in the area of the Society for the three year period ended 31 December 1955 in favour of The Linen and Woollen Drapers' Institution and Cottage Homes, Leylands Estate, Derby, designed by T. P. Bennett and Son (Sir Thomas P. Bennett, K.B.E., [*F*], Morris L. Winslade [*F*], Philip H. P. Bennett [*F*], W. Bonham Galloway [*A*] and George W. Bowes [*A*]).

The Council heard from the Practice and Public Relations Committees various points that had arisen concerning architects' sign boards. It was agreed that the use of the sign board should be permitted for any firm of architects provided that at least one full partner was a member of the R.I.B.A.

It was also decided to go into the question of allowing suitable firms in the provinces to prepare the boards from an approved pattern to be obtained from the R.I.B.A.

It was reported that the Council of the National Federation of Building Trades Employers had given approval to an increase in the limit of value of work which may be tendered for without quantities from £3,000 to £4,000. The National Quantities Rule promulgated by the N.F.B.T.E. therefore now reads as follows:— 'Members shall not tender in competition for contracts exceeding £4,000 in total value without bills of quantities being supplied. In the case of contracts for repetitive construction of small dwelling houses, the bills of quantities shall be prepared in accordance with the principles of the Code for the Measurement of Building Work in Small Dwelling Houses. This instruction shall not apply to contracts for repairs or contracts for painting or decorating only.'

The Council returned to the question of cladding as affected by London Building (Constructional) By-laws 1952.

The Secretary reported that in February 1956 the London County Council had given notice of their intention to introduce a new by-law on the cladding of buildings as follows:— 'Any cladding to a building, whether applied externally or internally, shall be of such materials, of such thickness and fixed and supported in such manner as the District Surveyor may approve, having regard to the particular circumstances of the case.'

On the joint recommendation of the Practice and Science Committees, representations had been made in May to the effect that it would be more in the interests of the public if discretionary powers were not delegated to a number of individuals but reserved for central exercise by the L.C.C. This would enable a body of information to be built up and co-ordinated centrally. A reply had now been received from the Architect to the L.C.C. saying that it was assumed that the Institute's representations referred to curtain walling of steel or aluminium frames with glass and other types of panel infillings. The intention of the new by-law was to control the fixing of decorative materials, e.g. marble slabs, etc., which were provided in addition to the statutory enclosures. It was now suggested that the definition in the by-law should be amplified by the following clause:— 'For the purposes of this by-law cladding shall mean a facing or architectural decoration additional to the required statutory construction but not so bonded to that construction as to exert common action under load.'

It was agreed to inform the London County Council that whilst there was no objection to the suggested clause amplifying the by-law, it was suggested that the by-law itself should be clarified by the substitution of 'facings' for 'cladding'. It was also agreed to add that it was hoped that the interchange of information among the district surveyors on the subject would lead to the discussion of precedents in the use of facings and facing materials and co-ordination of procedure.

Army Works Services Committee

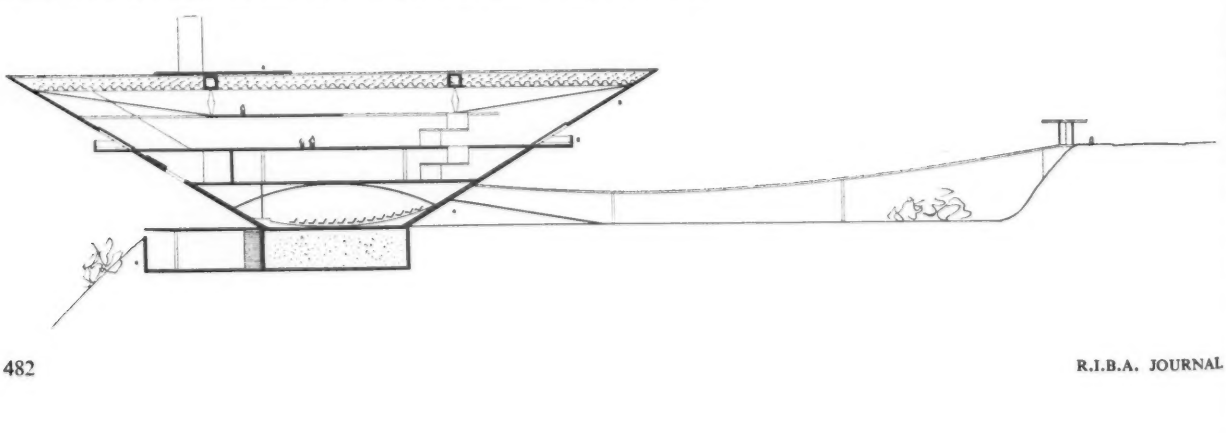
Mr. A. G. Sheppard Fidler [*F*] is one of the six members of a committee set up by the Secretary of State for War to review arrangements for deciding on and carrying out Army works services at home and abroad and to make recommendations. The committee, under the chairmanship of Lieutenant-General Lord Weeks, are expected to complete their investigations some time after the beginning of next year.

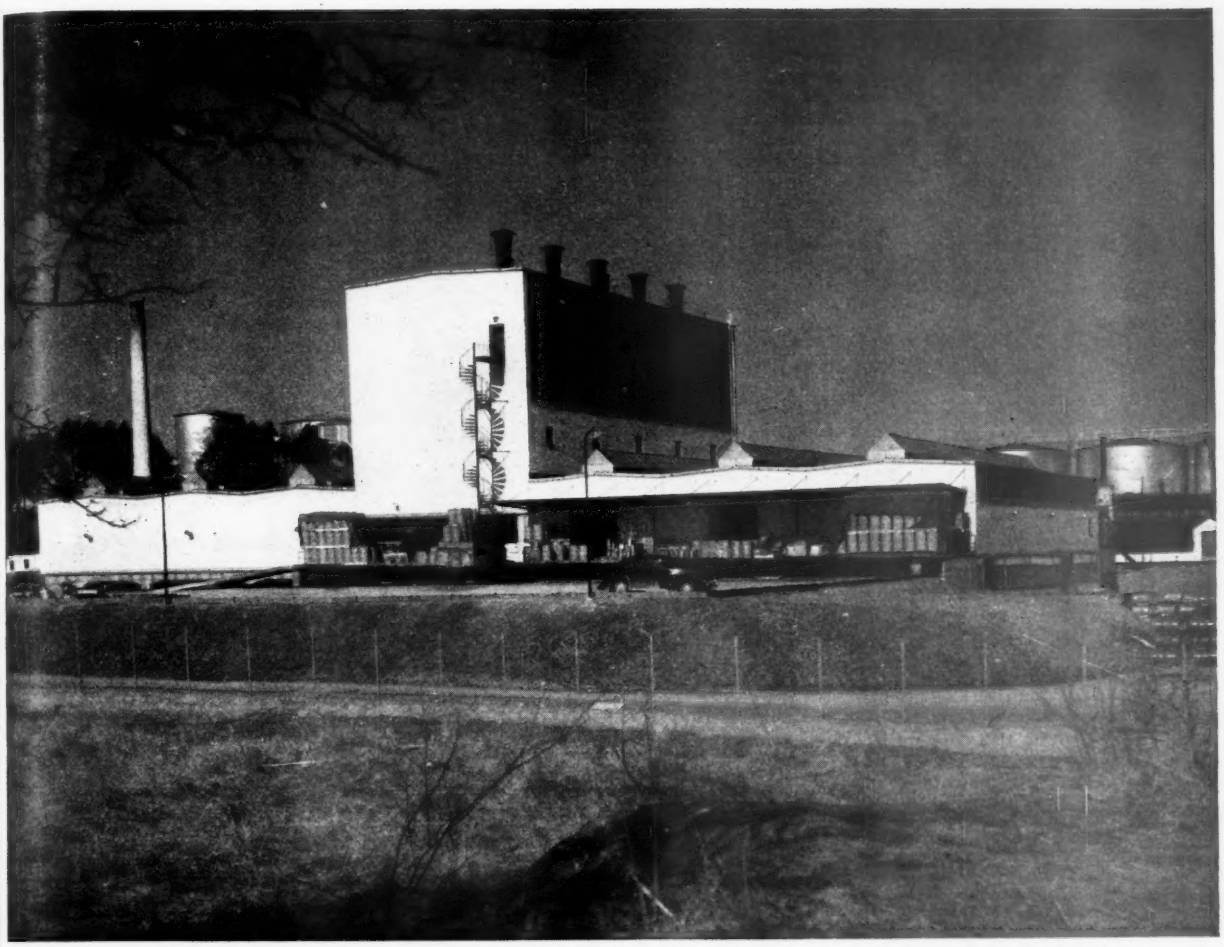
Cover Picture

The picture on the cover this month is reproduced from one of a series of photo-montage pictures of the model of Niemeyer's projected Museum of Modern Art, Caracas, which were presented to the Library by Professor Henry-Russell Hitchcock. A section is reproduced below for the benefit of members who have not seen the building illustrated. It has five floors, including a mezzanine of 4,000 square metres' exhibition space free of supports. Lighting is from overhead, some of which the sloping walls will reflect. The floors form an integral part of the structure. The prints in the Library include reproductions of a series of sketches showing how the present form was evolved.

R.I.B.A. Diary

TUESDAY 6 NOVEMBER. 6 p.m. General Meeting. President's Inaugural Address. Presentation of the London Architecture Bronze Medal 1955 to Mr. Frederick Gibberd, C.B.E. [*F*]. Unveiling of the portrait of Mr. C. H. Aslin, C.B.E., Past President. Presentation of R.I.B.A. Awards for Distinction in Town Planning.





General view showing the loading bay

Installation for the Storage and Blending of Lubricating Oils for the Shell Oil Company at Lidingö, Stockholm

Architect: Bengt Hidemark

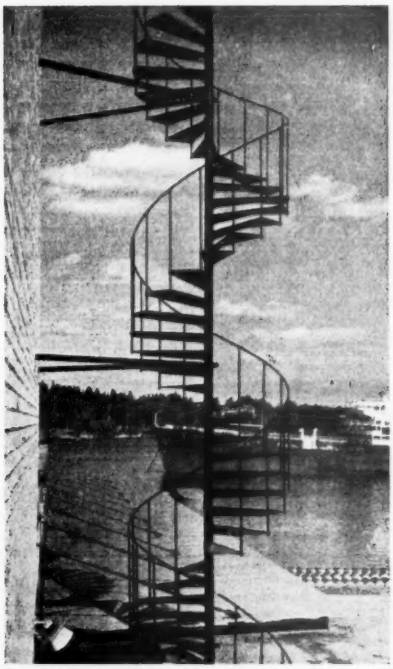
WE ARE INDEBTED to Mr. Thomas Mitchell, M.B.E., B.Sc. [*A*], for the following note on this building.

Most visitors to Stockholm will have been to the home and garden of the sculptor, Cark Milles, on the island of Lidingö, and may have felt sorry that the big petroleum storage installations which face it, across the water, should have had to be just where they are. This building, completed in 1954, is not part of that scene, for it is on the opposite side of the island, to the north-east. Those who have sailed back to Stockholm from Vaxholm may have seen it in the distance on their right.

For those interested in improving the architectural quality and practical working of industrial plants it is worth seeking out. I have never seen any building of its kind where more thought has been given to every detail.

Erected by the Shell Company, it is a depot for the receipt, storage, blending and despatch of lubricating oils. As the oil arrives by sea, it stands near the water's edge, with its own jetty. The conception is basically very simple. The oil is pumped through pipe lines in an underground duct to a series of elevated tanks, some housed high up in the main structure, some slung outside at the same level, like the inverted spirit bottles in a bar. It is then just a matter of arranging pipes and pumps—and heating, to make the oil flow in Stockholm's hard and long winter—so that the contents of the tanks may be filtered and mixed in any combination to produce the various kinds and grades that are deemed necessary for the different components of vehicles and motor boats, and thence into containers which are filled, sealed and transported automatically to loading docks for transport by land; all achieved by a few men pressing buttons and turning valves.

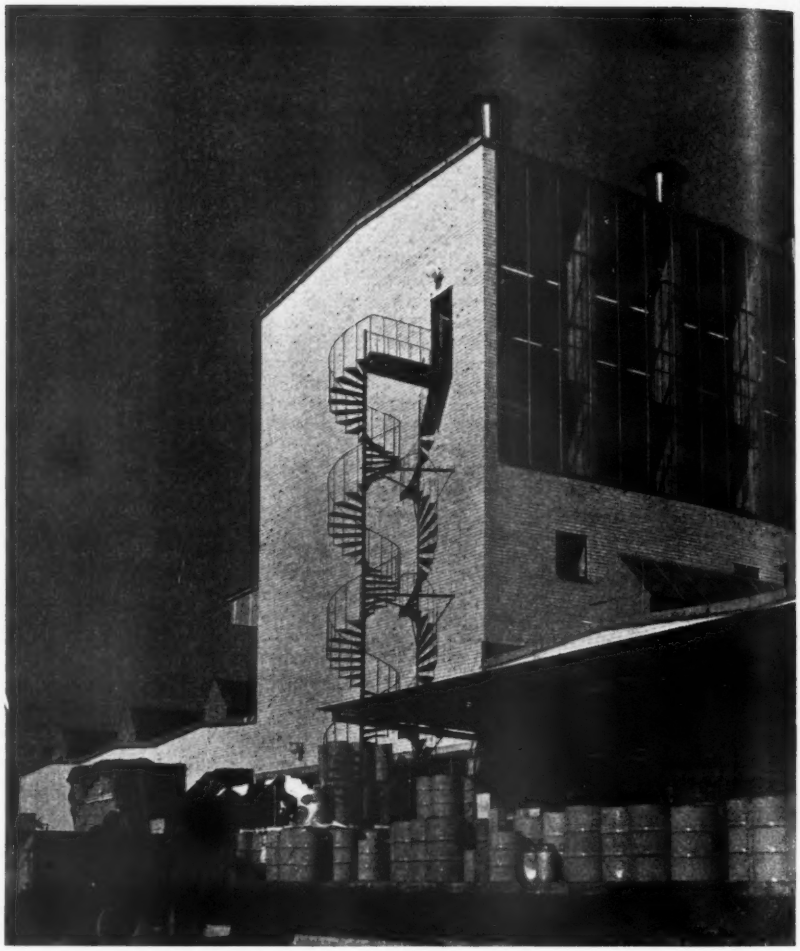
The result could have been a tidy but undistinguished collection of tanks and pipes. Here, however, enthusiastic young Mr. Hidemark has grasped every pipe and pump, every conduit and starter panel, and has not only assembled them in a way which from the sheer engineering point of view one suspects could not be bettered, but has made architecture out of it all, and has worried out every problem that these things create. Everything has been designed and drawn. There are no untidy penetrations of pipes through floors, walls or ceilings, and no junctions that are awkward



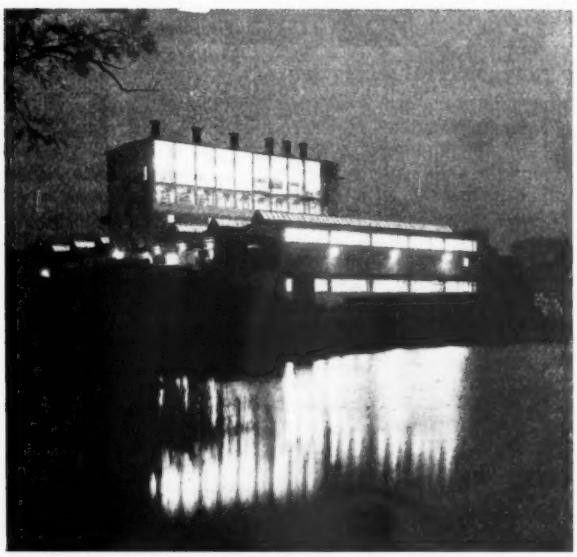
Escape stair with sea beyond

to look at or to clean. Even the boiler attendants' room was so attractive that when I was there it had been misappropriated by an executive.

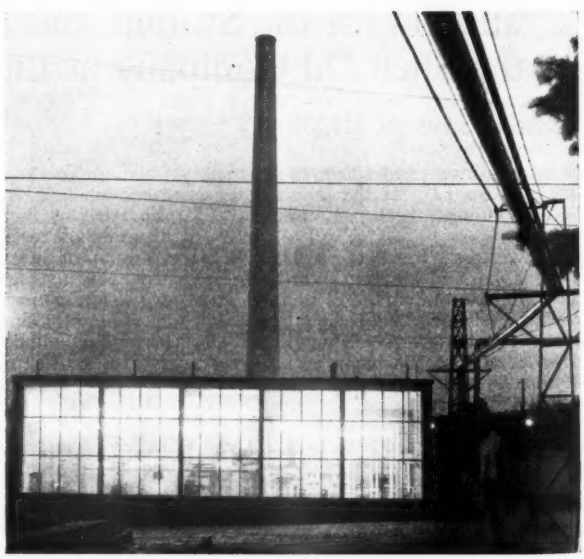
This building demonstrates quite decisively the results which can be achieved when an architect is allowed to control every detail of an industrial building and its plant, and is able and willing to do so. It might also be an object lesson of the care and trouble which must be taken if architects are to justify their employment on such work.



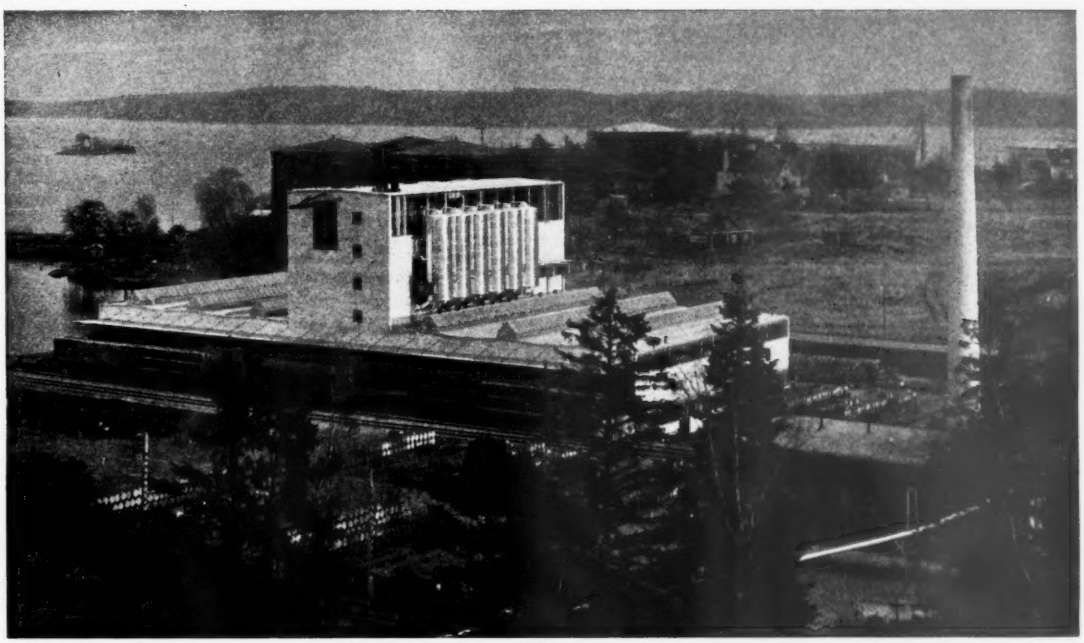
South-east corner of the blending section of the building



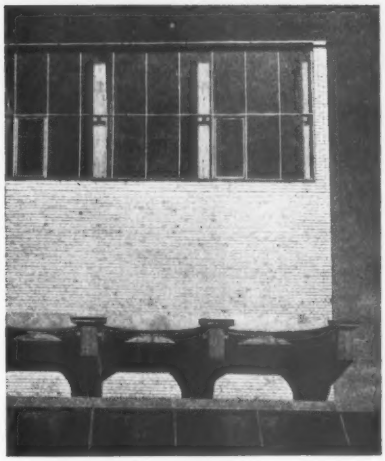
The factory at night from the sea

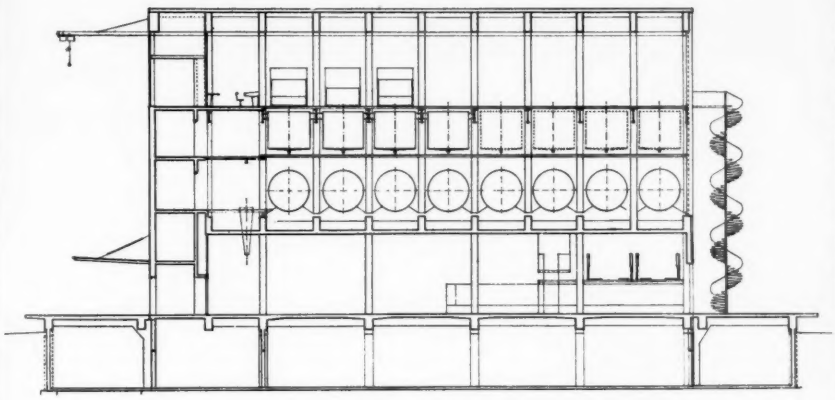


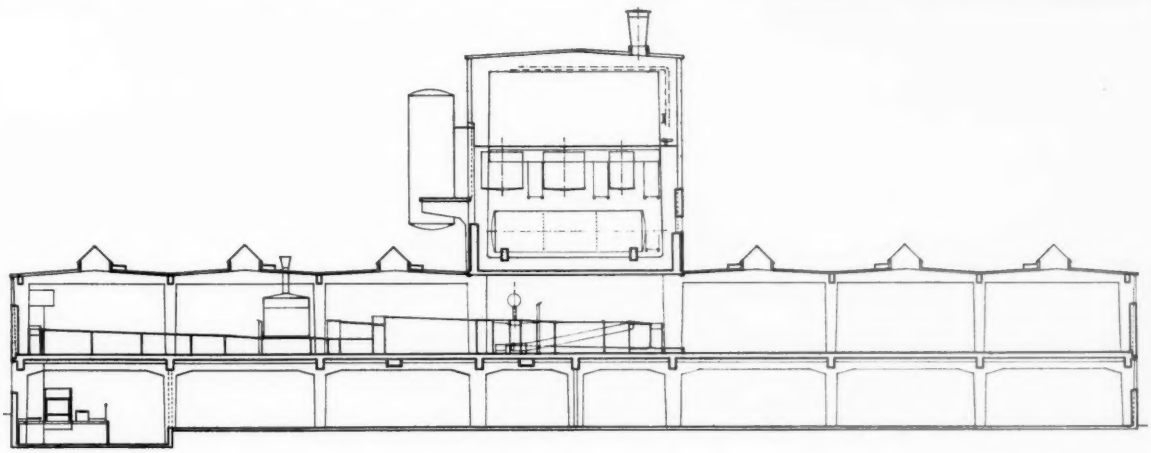
The boiler house

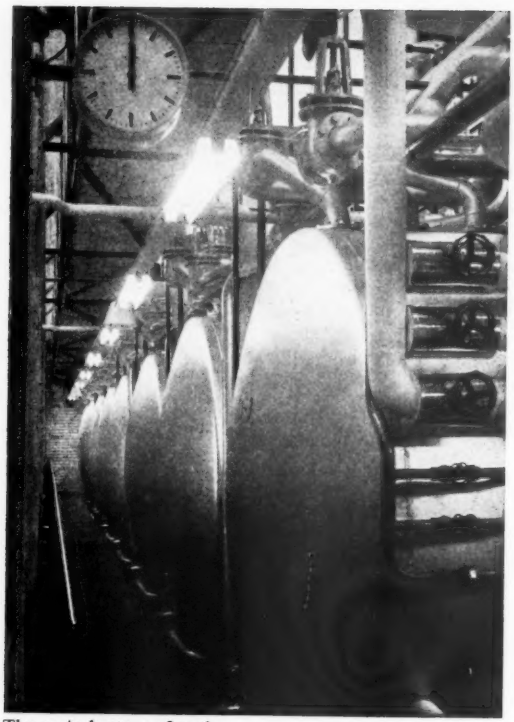


The oil-blending factory from the west. Right: wall detail showing supports for tanks. The interior is illustrated overleaf

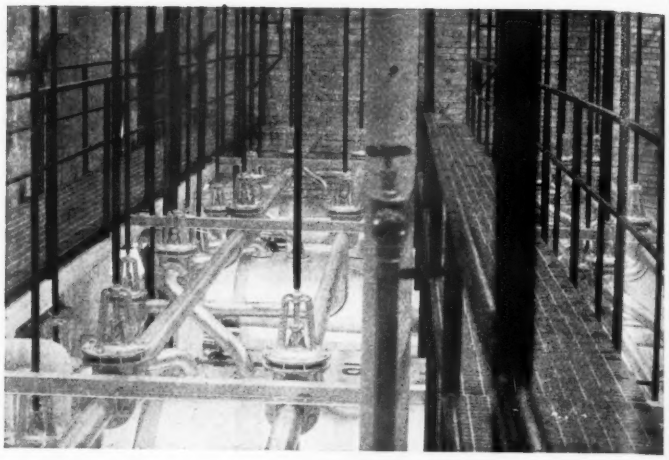




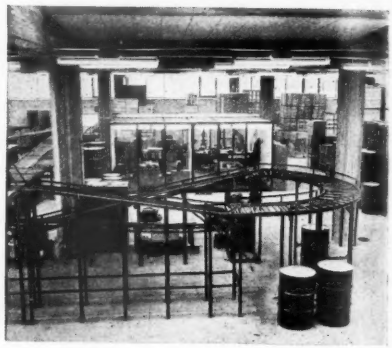




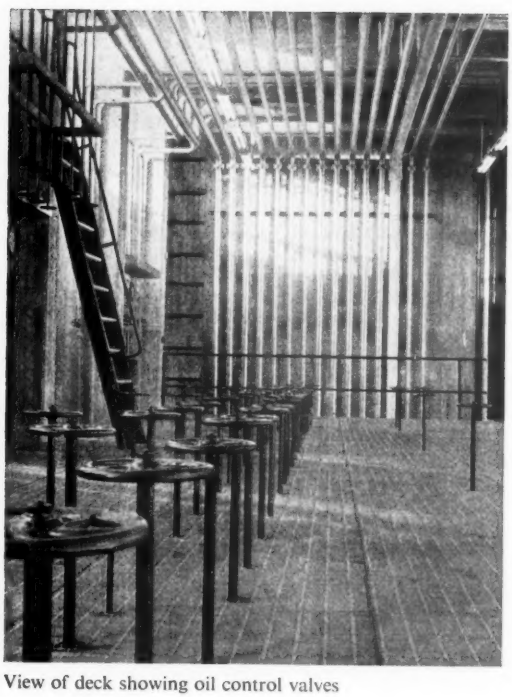
The main battery of tanks



Catwalks giving access to valves



The main floor level



View of deck showing oil control valves

Main oil-pumping equipment with control panels

Report on High Density Housing Schemes in Europe*—II

By R. A. Jensen, B.Arch., A.M.T.P.I. [*F*]

SOME PRELIMINARY CONCLUSIONS

1. It is desirable that flats should be constructed for selling as well as letting.

2. Low interest rate loans should be made available to building associations on the third mortgage loan basis and equally to private developers. This will encourage housing production by semi-voluntary agencies; will reduce administrative costs; will increase the total output of housing and will reduce overall subsidy payments.

3. At present false economic arguments are leading to partial strangulation of a vital part of the building programme; the construction of flats in cities. Whatever the views may be about new and expanded towns, these cannot be the whole of the housing programme, and flat construction in cities for very many reasons must continue or increase, together with slum clearance as a complementary part of the programme. The whole of the housing of the country cannot be at the low densities prevalent in new towns.

4. At present the trend is towards a large amount of jerry-building on valuable agricultural land, as this has appeared to be the speediest way of obtaining housing, and at the same time increasing home ownership and reducing subsidy payments.

5. The powers of acquisition of land in cities for housing purposes should be immediately reconsidered in view of the Town Planning Bill,[1] in order to allow the transfer at a non-speculative figure without the contentious development value element.

6. The low productivity in the building industry is most noticeable in work on flats because the building industry in England is traditionally related to small houses, and because flat construction normally needs specialised organisation, which is all too often absent and also because of outdated methods and building restrictions. This is having the effect of putting up rents and costs and lowering standards.

7. Standards on the Continent are at the moment generally, with the exception of France, higher than in this country. The areas of living space are more generous, partly because there is less waste of space for circulation purposes, owing to the use of the open plan. Central heating is provided in the majority of cases to all rooms and there is also central hot water. Double windows are normal, as are also tenants' storage facilities; tradesmen's telephones and other equipment at a high standard. Finishing materials are on the whole extremely good. There is also a very complete range, in general, of cupboards for all purposes.

8. There is very much greater flexibility in the application of town planning regulations on the Continent, although a number of obsolete town planning theories as propagated in this country still tend to influence town planners. However, the need for a greater variety of height of building and density, consistent with proper conditions of life, is well understood, and subject to the merits of the case the need for building *foci*, especially in cities and at suitable points related to open space or on high ground, etc. There is urgent need for a greater delegation of town planning powers to housing authorities, consistent with the observation of the main principles of the development plans, in order to avoid serious hold-ups in housing production and unnecessary and time-wasting squabbles between different local authorities involving also the time of the Minister's own department. There is also the need for town planners to realise that there are no golden rules of planning to be rigidly applied in all circumstances, and that town planning is not a science but an empiric study which must alter if it is to progress.

9. There are at present many serious handicaps to economical building, particularly in high blocks of flats, by reason of the obsolete building and fire escape bye-laws which operate. Internal staircases are general in Scandinavia and with proper safeguards need result in no added fire risk, especially if the lifts are in self-contained fire-resistant enclosures, independent of the staircase. Internal bathrooms and w.c.s should become general and there is no need whatever to ventilate these by artificial means, but merely with inlet and outlet ducts, which are most efficient. These result in considerable economies in building areas and in very much better planning arrangements.

10. Slab plans with or without gallery access can only be used satisfactorily to a limited degree and are otherwise extremely monotonous and by no means satisfactory from the tenants' point of view. This leads inevitably to a proportion of point blocks.

11. There is no reason whatever why our prejudices about back-to-back building should preclude flats being planned in point blocks with a common party wall, provided for example they have at least two outside walls; and this has been done most successfully, notably in Denmark, with corresponding economies. The aim should be to get, if possible, six flats per floor to each staircase and lift tower, which is a reasonably economic arrangement, and although orientation is not 100 per cent to all of the flats this, in practice, is found to be a matter of no importance whatever, bearing in mind the period that some members of the family spend in their flats, and that in inner urban areas there must obviously be some compromise.

12. There is the need to foster very much earlier and closer contractor-architect-civil engineer relationship, and to this extent local authorities should be allowed to select a small and much more limited list of contractors for certain of their contracts, particularly where development work and new techniques are involved.

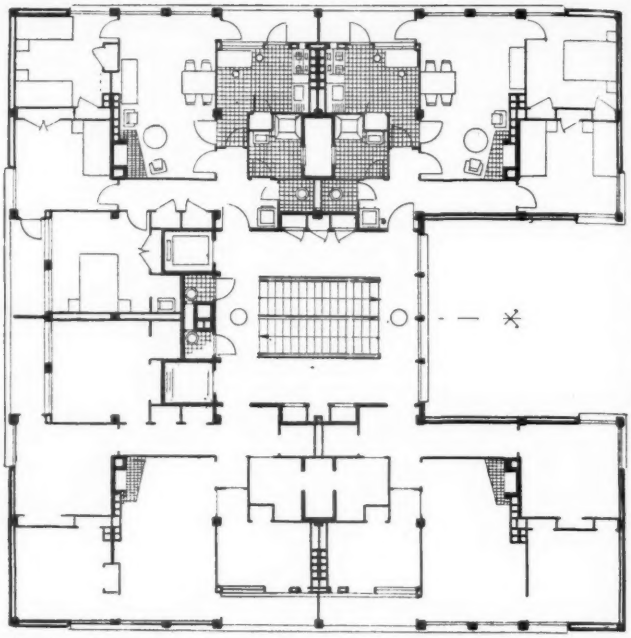
13. It is clear that the requirement to employ quantity surveyors in this country on all contracts over £2,000 does not necessarily introduce economies. The services of these consultants are extremely expensive and the too precise definition of the last screw in the building tends to have the very serious effect of precluding initiative on the part of the contractor, who may have a most useful contribution to make in the way of revision of details of construction or method of erection, in which he is obviously a specialist.

14. There is still too much difficulty in formulating definite housing programmes two to three years ahead, with the result that in this country complete pre-planning is seldom, if ever, done. We shall never get really speedy construction, a high rate of productivity or avoid costly variations and alterations until this difficulty can be overcome, and it is a serious matter of policy that needs looking into. It should be perfectly feasible to say now in relation to the Government's capital investment programme what the housing figure is to be and from that give local authorities a firm programme three years ahead. The materials are available if they are properly selected and ordered in advance, and labour is available, and this should result in building without continual stoppages which have so greatly demoralised the industry in this country since the war.

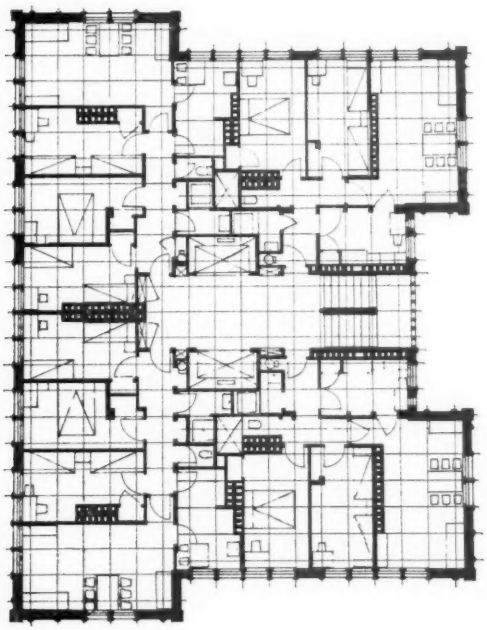
15. The Ministry of Housing should be prepared to make special concessions to authorities or organisations who are prepared to carry out the very necessary experiments required in constructional methods and techniques in high building especially. We are very seriously behind practically every other country in this

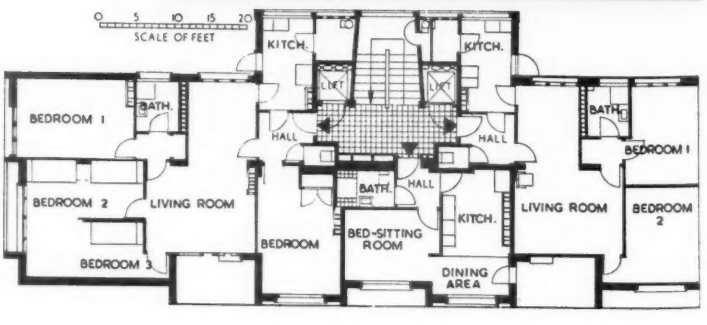
* The Rose Shipman Studentship 1954.
[1] Now the Town and Country Planning Act 1954.

Villeneuve St. Georges: four 15-storey slab blocks forming part of a large development S.W. of Paris (plan below). Architect Solotaref.



Brest: typical floor, 13-storey tower block, one of the best designed schemes in France, rising out of the ruins adjacent to the harbour. Architects: Gravereaux and Lopez.





Right: Porte Brancion: three 13-storey slab blocks employing extensively prefabricated units of all types. Architect: Pison.

respect, and partly because elsewhere it has been realised that although this work may result in higher costs to start with, ultimately economies will result. This has, in fact, proved to be the case in many notable examples. We are still struggling with out-of-date and expensive slow techniques, such as brick-laying and a high proportion of complicated in situ reinforced concrete, for example, where there are other speedier methods available. It might do a great deal of good if some of the specialist firms dealing with prefabricated and precast work abroad were to carry out work in this country, and it is already hoped that negotiations on these lines may be fruitful.

16. It should also be realised that the initial capital cost is only a part of the ultimate financial picture and greater encouragement should be given to experiments in the production of materials that are likely ultimately to be an improvement from the maintenance point of view in reducing running costs, and any materials which in themselves may be slightly costlier but have the effect of reducing man power requirements or producing earlier completion with corresponding earlier income.

17. There is scarcely a country in Europe that has not now made the introduction of underground air-raid shelters compulsory in all housing schemes, and as these can be combined with tenants' storage, cycle-pram sheds, etc., it appears that a very serious omission is being made in not insisting on similar provision in this country.

18. In most western European countries flats are being produced, even in tower blocks, at a cost nett of between £1,250 and £1,500.

19. Production in all northern countries is speedier than here—Germany, for example, producing 523,000 houses per annum with the same labour strength as in this country produces 320,000 housing units per annum.

20. Materials such as B.I.M.S. bricks are made in enormous quantities of pumice aggregates—in vibrators. Aerated concrete blocks are cheap and plentiful in most other European countries, as also Leca concrete blocks. Cement rendering is put on under pressure from a gun and is excellent and non-crazing. Concrete finishes are, as a rule, in advance of this country, either in smooth or textural surfaces.

21. Sliding shuttering, tower cranes, counterweight hoists and elevators are plentiful and efficient in use.

Suggested Ideal Specification for future High Density Housing Schemes based on the best European work 1954

1. Point blocks show considerable advantages in providing freer and a greater amount of garden space and avoid the monotony of slab block layouts. They are not in themselves monotonous if used judiciously as focal points and mixed with a suitable layout of lower slab blocks. Access balconies are to be avoided where possible, in view of the loss of privacy, exposure to weather and unsightly appearance. Staircase access of the normal pattern is, on the other hand, uneconomical in view of the small number of flats per floor.

In many respects the ideal point block is that with four flats per floor within a rectangular plan with the staircase and lifts centrally placed, although the aim should be, if possible, to place six or even eight flats per floor, provided that there is no over-looking as between flats, and reasonable orientation is provided. Six flats are probably the maximum satisfying all the requirements, but eight are feasible if kitchens and bathrooms are concentrated at the intersection of the arms.

Any more than four flats per floor mean either 'T', 'Y', or 'X' type of plans with an increase in the amount of external wall, which can only be limited by the use of the back-to-back plan. This is, however, satisfactory if each flat has at least two outside walls, thereby ensuring good ventilation and insulation.

Bearing in mind heat losses and the cost of external cladding, together with simplicity in construction, four flats per floor may well prove the best proposition economically.

2. Individual flats should be planned without internal circulation space: in other words, on the 'open' plan, which results in considerable economies and produces a more satisfactory living pattern, together with a dwelling that is much more readily warmed in the winter.

3. All bathrooms and w.c.s should be planned so as not to take up outside window space and should be artificially ventilated, but without the use of fans. The shunt flue system, widely used on the Continent, is economical and extremely efficient for this purpose.

4. Main access staircases and lifts should be planned centrally in the core of the point block without necessarily providing them with direct external light or ventilation, except possibly from a roof lantern. If these are built in self-contained concrete enclosures the fire risk can be minimised. There should be no secondary or escape staircases as these are expensive and unnecessary.

5. The system of construction should be that of the simplest possible reinforced concrete frame precast as far as possible, without interfering with the rigidity of the whole, which can be preserved by the use of a poured in situ core.

The floors should be semi-precast with a self-finish soffit, and external walls should consist of precast concrete panels cast in metal moulds with an inner cork lining for insulation purposes; such panels would require no subsequent maintenance.

The structural beams and columns, where in outside walls, would also contain aero-concrete and cork insulation on the inside face.

6. Internal wall skins and internal partitions should all be in cellular plasterboard panels of floor to ceiling height with the joints scrimmed and taped, but no wet plaster should be used anywhere.

7. All windows should be in aluminium or concrete frames where cost allows, in order to minimise maintenance, and should all be accessible for cleaning from the inside of the building without the use of special gantries. This can either be done by centre hung hoppers which turn through 360 degrees, or, alternatively, by sliding units which can be reached from the inside.

8. Central heating should be provided in all rooms and in all flats, with the radiators placed below the windows where they do most good and are least likely to damage decorations. Air heating is most efficient of all but floor or ceiling panels are very effective.

9. A full range of built-in cupboards should be supplied to bedrooms and kitchens, and for clothes, meters, etc.

10. Electric, gas, heating, water and other meters should be accessible from outside the flat.

11. Staircases should be formed in precast concrete units with precast stringers to take separate precast treads and risers, subsequently fixed.

12. Cycle, pram and baggage storage rooms are essential for every flat, and if these are planned in the basement they can also be suitably designed to act as air-raid shelters.

13. If cost permits and balconies are incorporated in the flat design these should also contain an enclosed section with, for example, concrete louvres for the purpose of drying clothes.

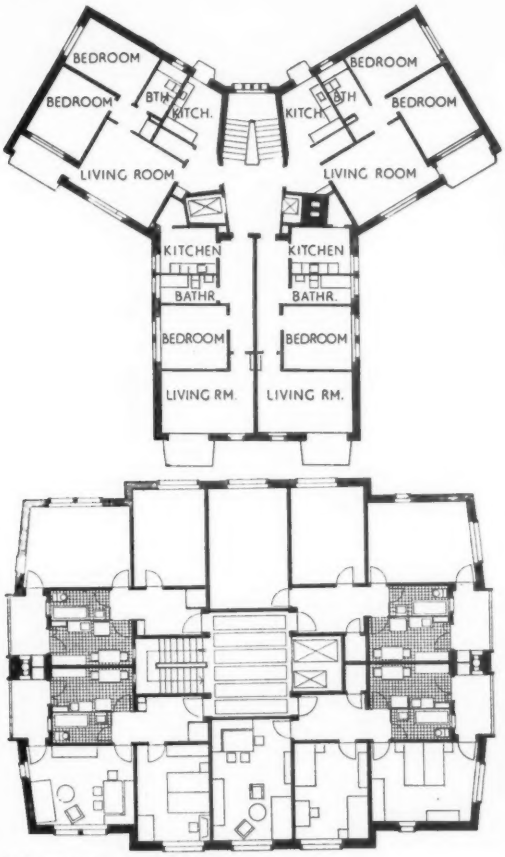
14. Provision should be made for doing the necessary home-laundry if desired in the kitchen, in the form of a deep sink and space for a washing machine. Only in large estates are communal laundries justified, and even then are expensive to provide and in upkeep, and a responsibility from the management point of view with the mechanical equipment which cannot be rendered foolproof.

15. It is advantageous to plan a small number of general-purpose shops even in a small estate.

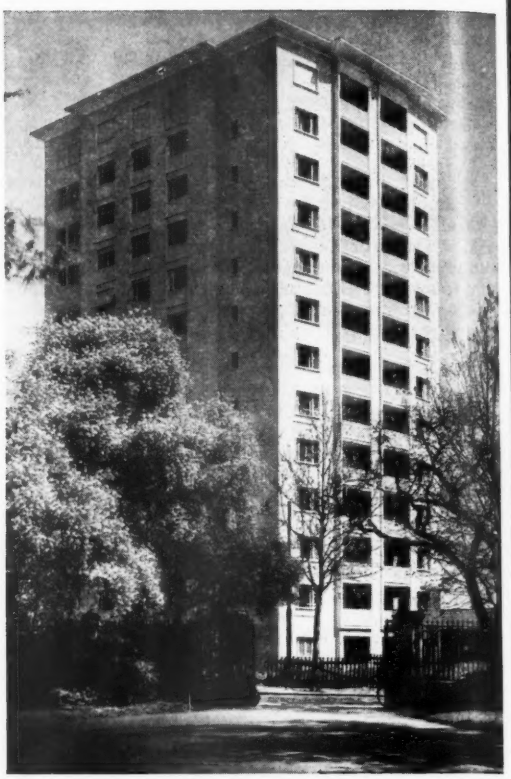
16. Unless there is adequate provision already in the vicinity, not necessitating the crossing of roads, a kindergarten school should be incorporated and also welfare clinic and adequate playgrounds for children of all ages, incorporating a children's house and sand-pit, and probably some simple play sculpture or non-mobile apparatus.

17. Lawns should be laid right up to the face of the building and roads of all kinds reduced to the minimum. Paths can be provided in the form of stepping stones which can be formed in precast concrete slabs of, say, hexagonal panels. There

Letzigraben: two 11-storey point blocks on a 'Y' plan (shown below), the climax and focus of a fine piece of three-dimensional planning. Architect: A. H. Steiner

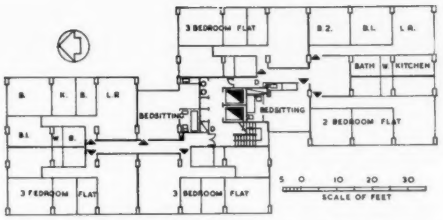


Mittlerstrasse: typical floor.



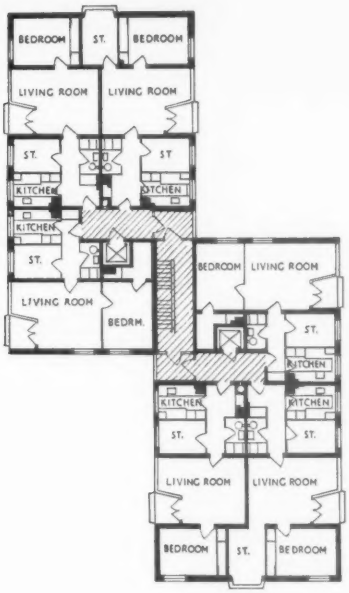
Mittlerstrasse: three 13-storey point blocks remarkable for their load-bearing brick structure (plan bottom left). Architects: Gfeller and Mahly.

Bellahøj: point blocks, one of the best and most significant schemes in Scandinavia which initiated an entirely new type of linked-block (or domino) design. (Plan on facing page.) Architects: Kristensen, Fink and others



Hall Park Area Development, Metropolitan Borough of Paddington. Architect: R. A. Jensen. Typical floor plan of block planned to the most economical standards but not acceptable under building bye-laws relating to means of escape.

Søndermarken: five 15-storey tower blocks. Another extremely successful and well-planned scheme in Copenhagen (plan below). Architects: A/S Dominia.



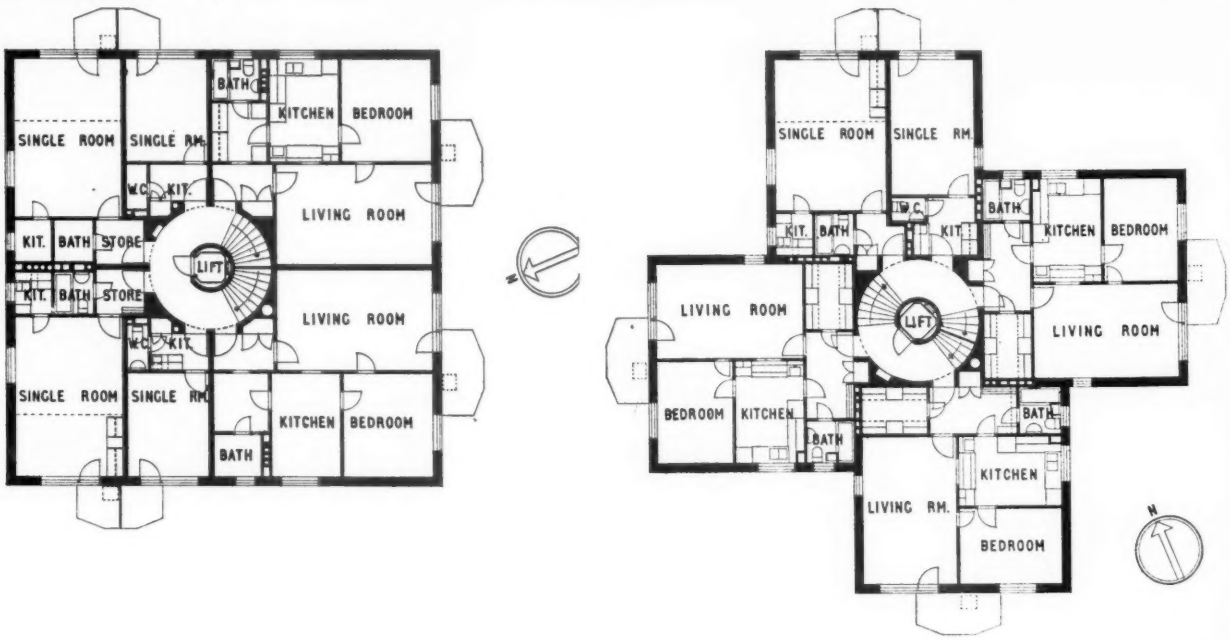
Bellahøj: typical floor.

should be a reasonable number of hardy shrubs and of trees such as birch, willow, oak, ash or the conifers, which will be in scale when fully grown with the buildings and which will not be so close as to overshadow or cut out daylight from any of the flats. The flat roof should be available for use if desired and planned with a small pergola and a broad parapet wall to avoid any degree of risk. Children's windows should be included to give a view of the surroundings without the necessity of climbing the parapet.

18. The whole of the planning of the flats should be based on design modules in order to ensure the greatest possible standardisation and the minimum number of variants in the different types of unit employed. It is also desirable to have repetition as between the various floors in the building.

19. It is essential to ensure that there are no maintenance difficulties externally, especially in view of the height of the building, and all materials must be chosen with this in view. Tall staircase windows should be avoided wherever possible as cleaning these is an insoluble problem.

Vällingby: point blocks by various architects including Klemming, Ancker and Gate. Somewhat stark and unadorned, but admirably effective in the extreme simplicity of design.



20. Building equipment should include dry risers for fire-fighting purposes; a water and drainage point for staircase washing at each landing level and suction cleaner points at half-landing levels. Lightning conductors should always be installed and a radio relay installation together with communal sound and television aerial.

21. Gas should be installed for cooking and refrigeration purposes only, with a corresponding reduction in cost of carcasing and fittings.

22. Ventilation ducts and pipe ducts are most readily formed in vibrated precast concrete block units.

23. Floors should either be in timber or, alternatively, plastic tiles with glass silk insulation mats.

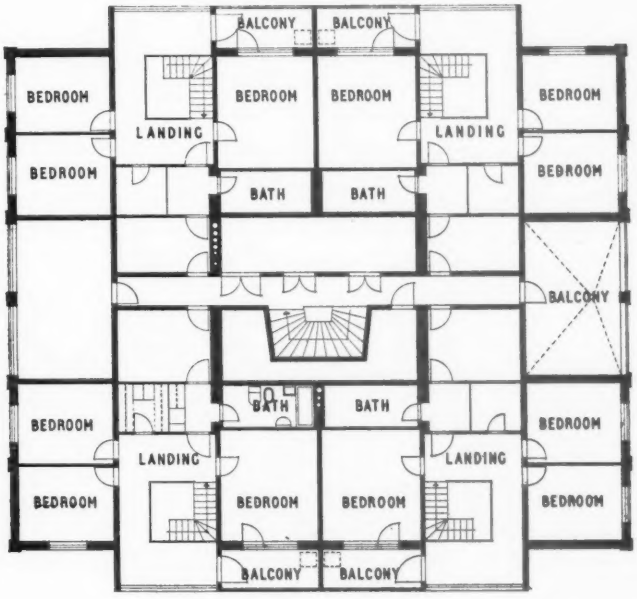
24. Wall finishes should be in emulsion paint sprayed on or applied with a roller, alternating with wallpapers suitably protected with clear plastic finish.

25. Terrazzo or decorative concrete laid in panels is the most satisfactory finish for public halls, staircases and also dados.

26. It is very desirable that visitors should have telephonic communication with the various flats through a location board which contains the names of the tenants, a communicating button and a loudspeaker. This panel is placed in an outer lobby and the inner door electrically operated by the tenants only as and when the visitor has been identified. This eliminates all question of intruders and nuisance in the block. It

Göteborg, Guldheden: high houses. Another 'domino plan' variant, with concessions to tradition in the pitched roofs. (Typical floor on left.) Architects: Brolid and Wallinder.

Kärrtorp: point block. A most skilful example of very compact and economical planning. (Typical floor on right.) Architect: Klemming.



European Housing: Details of Costs and Densities

COUNTRY	COST	NET DENSITY
FRANCE		
Le Havre ..	£2 7*s.* 6*d.* sq. ft.	a. 200 per acre
Sotteville ..	£2 10*s.* 0*d.* sq. ft.	a. 250 per acre
Villeneuve ..	—	a. 250 per acre
Pantin	£2 1*s.* 6*d.* sq. ft.	200 per acre
Asnières	—	
Brancion	£1,500 per flat	a. 250 per acre
Sèvres	—	a. 250 per acre
Garnison Lyons ..	—	400 per acre
Chambéry ..	—	280 per acre
Vincennes ..	—	275 per acre
Rond Point ..	—	150 per acre
St. Etienne ..	—	215 per acre
Strasbourg ..	£3 10*s.* 0*d.* sq. ft. (£1,850 per flat)	a. 130 (?) per acre
Brest	£2 9*s.* 0*d.* sq. ft.	a. 100 (?) per acre
Boulogne ..	—	a. 300 per acre
(Average, say £1,600 per flat)		
HOLLAND		
Kleinpolder ..	—	200 per acre
(Average £800 per flat low blocks) (Average city density, 200 per acre)		
BELGIUM		
Ten Wyngaerde ..	£1,513 per flat	a. 500 per acre
Luchtbal	—	660 per acre
Kiel Anvers ..	—	250 per acre
ITALY		
Barra	—	180 per acre
St. Paolo	—	250 per acre
Tuscalano ..	—	200 per acre
Bernabo	—	160 per acre
(Average £1,250 per flat)		
ENGLAND		
Perkins Heights ..	£1,680 per flat	330 per acre
(Comparable figures: normal average flat 700 sq. ft.)		

COUNTRY	COST	NET DENSITY
SWITZERLAND		
Beaulieu	—	280 per acre
Malagnou ..	£2 6*s.* 1*d.* sq. ft.	180 per acre
Charmilles ..	£1 13*s.* 6*d.* sq. ft.	180 per acre
Letzigraben ..	£2 7*s.* 0*d.* sq. ft.	150 per acre gr.
Mittlerstrasse ..	£2 13*s.* 0*d.* sq. ft.	350 per acre
Steinenvorstadt ..	5*s.* 5*d.* ft. cube	mixed
(Average, say £1,750 per flat)		
W. GERMANY		
Max Kade House	—	a. 300 per acre
Grindelberg ..	—	a. 250 per acre
Habichtsplatz ..	—	a. 180 per acre
(Average £1,165 per flat) (2*s.* ft. cube)		
DENMARK		
Bellahøj	£1,500 per flat	g. 140 per acre
Rødovre	34*s.* sq. ft.	a. 250 per acre
Søndermarken ..		g. 160 per acre (n. 250 per acre) (?)
Sorgenfri	38*s.* 6*d.* sq. ft.	215 per acre
(Average 39*s.* sq. ft., say £1,400 per flat) (Inner city average 350 per acre)		
SWEDEN		
Kärrtorp	3*s.* 8*d.* ft. cube	Mixed
Reimersholm ..	—	a. 180 per acre
Vällingby ..	£3 3*s.* 0*d.* sq. ft.	—
S. Hammarby ..	£2,275 per flat	110 per acre
Vattenveroniken ..	52*s.* 6*d.* per sq. ft.	120 per acre
Mänviolen ..	52*s.* 6*d.* per sq. ft.	—
Vastertorp ..	4*s.* 10*d.* ft. cube	—
Vittsjöborg ..	£2 14*s.* 6*d.* sq. ft.	370 per acre
Dal Malmö ..	£2,750 per flat	—
(Average £480 room, say £1,400 per flat) (£2 16*s.* 6*d.* sq. ft.) (Inner city density average 300 per acre)		
NORWAY		
The Hoff	£2 7*s.* 6*d.* sq. ft.	—
(Average £2 2*s.* 6*d.* sq. ft., say £1,500 per flat)		

is also necessary to incorporate in this scheme letter boxes for each of the tenants and also self-locking boxes for tradespeople—also in the outer lobby, which obviates the need for tradespeople to use the lifts.

27. A deep tub is in many ways preferable to the long bath if provided with a shower fitting, and is considerably more economical in space and, incidentally, in the use of water.

28. All plumbing needs careful detailing and planning in such a way that it is concealed and yet accessible and with the shortest possible runs laterally between the fitting and the riser duct.

29. Double glazing should be introduced for all external windows to flats, which can then be large enough to allow of good natural daylighting but, at the same time, will avoid excessive heat losses.

30. Raised thresholds should be provided to all doors both external and internal, thus obviating unpleasant draughts and at the same time allowing for the door to pass over the thickness of floor coverings.

31. All internal doors should have loose pin hinges to facilitate their easy removal.

32. To all the larger windows sunblinds or louvred blinds operated from inside the room are desirable.

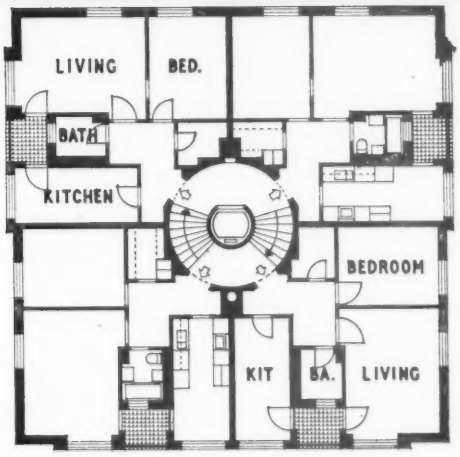
33. It is essential for ease and speed of erection, especially with large prefabricated units, to have mobile tower cranes available for each separate block and at the same time counterweight hoists and mechanical elevators. Conveyor belts and cement silos are also invaluable aids. For decoration the air-controlled paint roller is extremely rapid and efficient.

34. It is essential that all architectural details, together with those prepared by engineering consultants, should be 100 per cent complete before commencement of the work so that there is no expensive cutting away in concrete particularly, and no alterations in layout or planning during the course of the work.

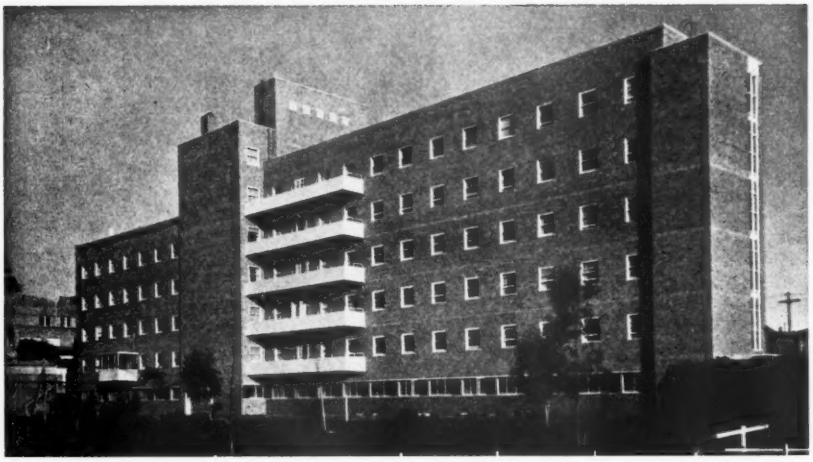
35. The aim should be to obtain flats at not more than £1,500 average cost all in, at a rent of approximately 30s. 0*d.* per week average, and as a maximum the rent to be not more than 20 per cent of the tenant's income.

36. While 'paternosters' and lift cars without doors are economical there is an element of risk attached. Landing doors can be of swing variety at much lower cost and lifts need stop only at alternate half landings. One lift should be large enough to carry furniture and fire equipment and easily accessible motors should be accommodated at the top floor level, if possible.

37. Tremendous economies in space and initial cost and savings on maintenance result from the use of 'flushing valves' in place of W.W.P.S.

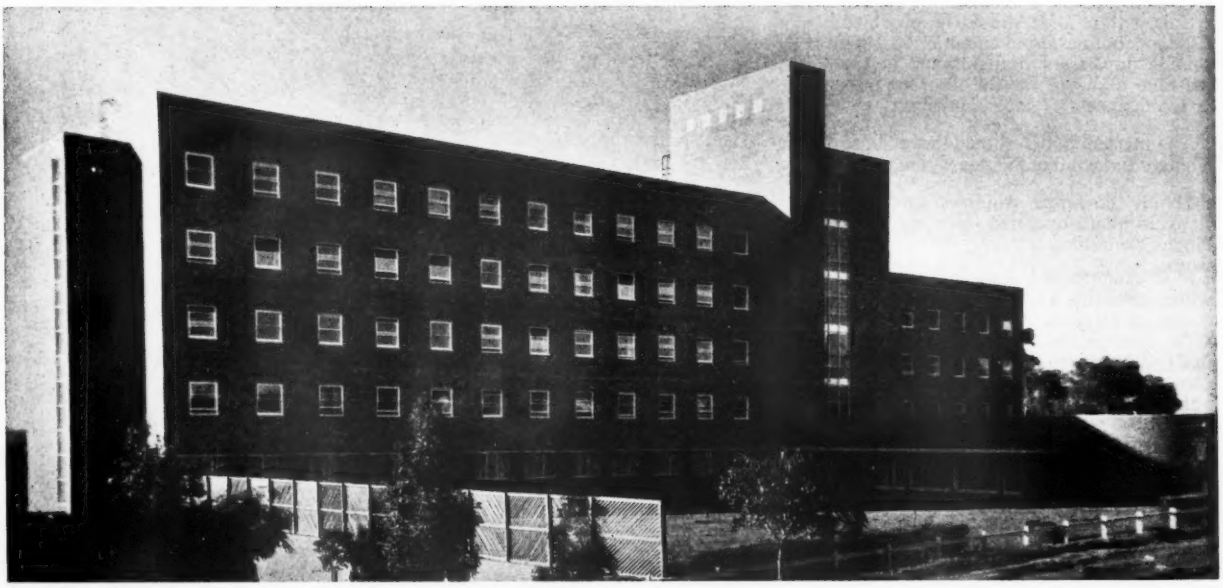


Räcksta, Vällingby: point blocks which provide one of the subsidiary centres of interest of this large area and in this instance are intended to cater for smaller families or couples. The planning is in direct descent from the Danviksklippan model. Architects: Ancker, Gate and Lindegren.

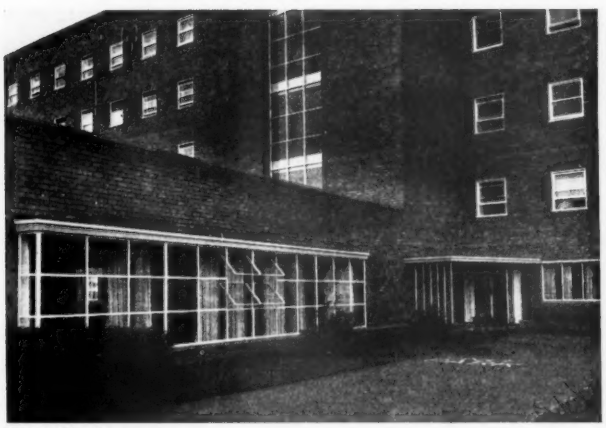


Nurses' Quarters

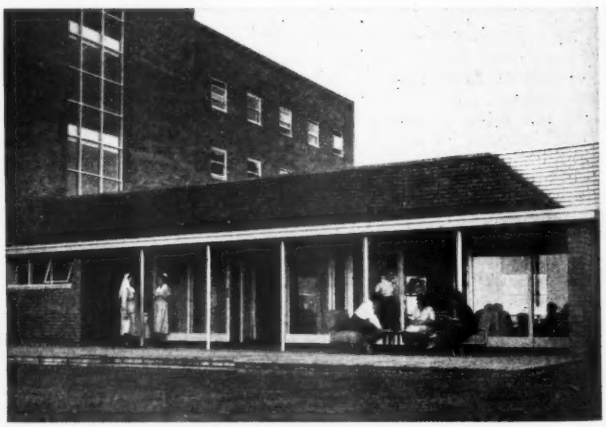
For the five-year period ending 31 December 1955 the R.I.B.A. Architecture Bronze Medal in the area of the Western Australian Chapter, Royal Australian Institute of Architects, has been awarded in favour of the Nurses' Quarters Building attached to the King Edward Memorial Hospital, Perth, designed by the Public Works Department: Principal Architect, A. E. Clare, F.R.A.I.A. [*F*].



Street Elevation

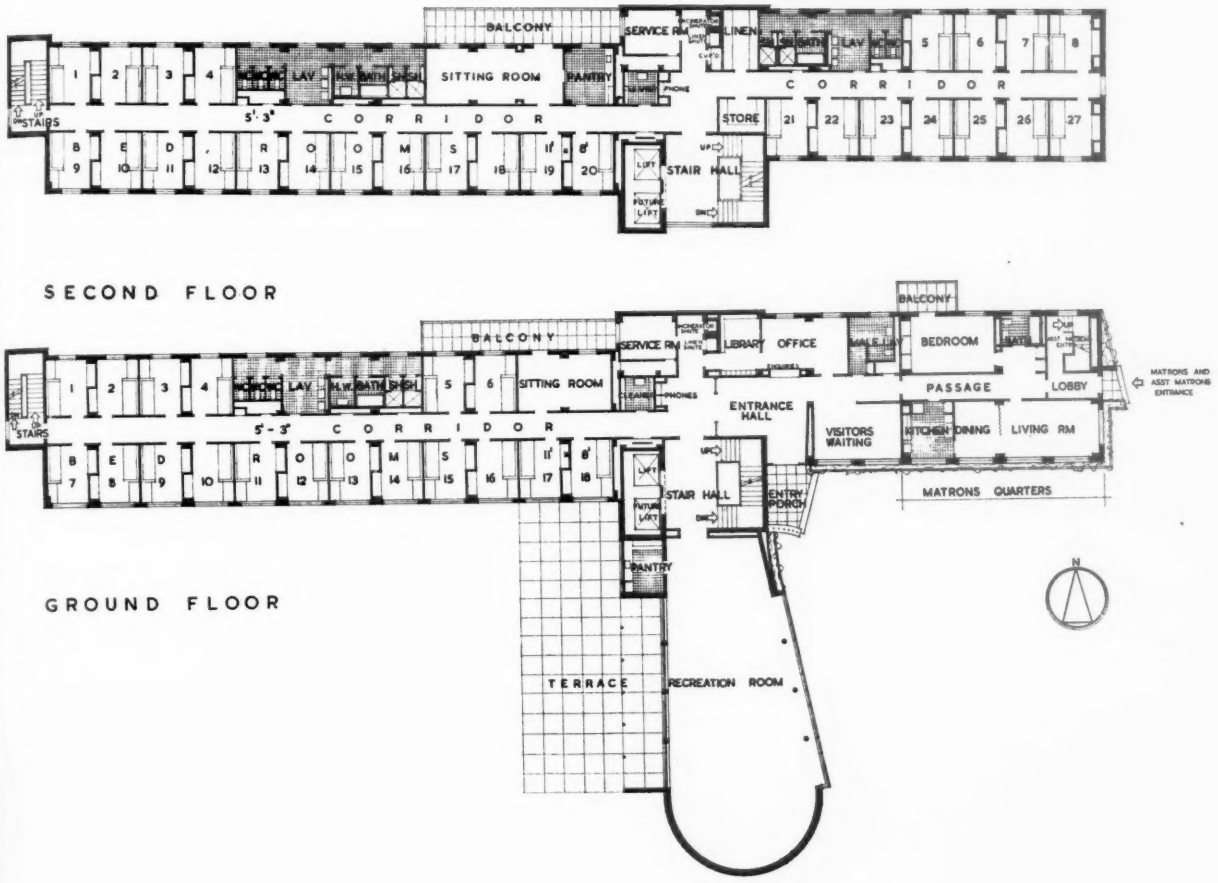


The Main Entrance

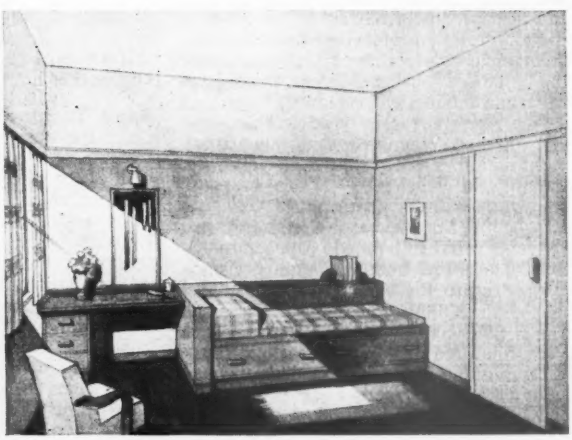


The terrace to the Main Lounge

Building, King Edward Memorial Hospital Perth, Western Australia



One end of the Main Lounge



Sketch showing the built-in furniture in a typical bedroom

Buildings for Research

Two papers (abridged) read at the D.S.I.R. Symposium on The Direction of Research Establishments, held at the National Physics Laboratory, Teddington 26–28 September*

What is Required

by F. M. Lea, C.B.E., D.Sc., F.R.I.C.

Director of Building Research, Department of Scientific and Industrial Research

THE PURPOSE of this session is to discuss the design and provision of the buildings in which research is carried out. It falls into two parts, the identification and statement of needs, and the planning and design of the buildings to meet those needs. The first, the preparation of the brief for the architect, is the subject of this paper, and the second, the conversion of the brief into design and construction, that of the paper which is to follow.

There are two distinct types of project to consider, the site layout for a research organisation requiring numerous buildings, and the planning of the individual laboratory. The first must be dismissed very briefly.

Site layout. In general, research organisations take up more land per worker than industry and there is no need for them to be located where land is most costly, in the central areas of towns. The outskirts of towns are very suitable.

There are two basic ways of allowing for expansion in considering the layout of buildings: to concentrate the original premises so that expansion is radial, or to spread the buildings more widely so that each can serve as a nucleus for expansion into the space surrounding it. The first can lead to awkward splitting of related work, or services, at a later date and the second, if carried to excess, to greater initial expense and increased running costs in maintenance of grounds and services. It can also become a barrier to the unity of the organisation and the close working together of its separate parts. The sites for the buildings housing different branches of work and services will obviously be chosen so that the more closely related activities are adjacent. When rehousing an existing organisation a study of 'work-flow', i.e. the way in which the various branches co-operate with each other, can very usefully be made in the existing establishment.

A choice has to be made between multi- or single-storey buildings and decisions reached as to the extent to which workshops, stores, library, etc., are to serve the whole organisation or to be in part or whole allocated separately to various major research units. It is generally cheaper, and in other respects more advantageous, to house pilot plant or large-scale testing equipment in separate buildings than to combine them in large general laboratory buildings. Only in the case of a relatively small organisation is a single building likely to be the best solution, and even then some other simple type of accommodation will usually be needed for rough work and bulk storage, etc.

The Individual Laboratory Building. Though laboratories are many, and each will have been the subject of detailed examination, no broad study of laboratory buildings comparable with that carried out for hospitals, schools and other special types of buildings has been published. The Division for Architectural Studies of the Nuffield Foundation is at present engaged on such a study and its results should provide guidance on many matters even though research laboratories do not lend themselves to such a degree of systematisation as hospitals or schools.

The brief for the architect for a laboratory must obviously detail the space requirements and services, and the general layout desired, but it should do more; it should outline the general nature of the work and the way in which the staff are organised, for this can be of much help to the architect in detailed planning and in considering possible alternative suggestions.

In the preparation of this brief the heads of the various sections to be accommodated will have had the opportunity to state their needs and will often do so with considerable precision in the light of the existing work and organisation. It is however a common experience that within a few years of the completion of a laboratory, or even before it is occupied, there has been some change in staff groupings or needs. The broad needs must obviously be met, but planning should not be tied too closely to the idiosyncrasies of the individual.

The more important items to be covered in a list of requirements for a laboratory building are set out in Table I. Much of this list must be left to speak for itself and comment is limited to some selected points.

Space Required in Laboratories. Sometimes the nature of the work determines the size of the room required. This is so with large-scale engineering testing, for instance, where the sheer bulk of the equipment needed is alone the deciding factor. Routine bench work, such as chemical analysis, can often with advantage be done in large laboratories, but it is more common in research organisations to find existing large rooms being sub-divided than small ones being run together. For most small-scale work two to four people to a room seems to be the most general allocation. Lorne Gray[1] has shown that, in the laboratories operated by the National Research Council of Canada, 'useful' space (i.e. space other than that occupied by the thicknesses of walls, and by corridors, staircases and cloakrooms) varies from 158 sq. ft. per worker in an electronic development laboratory to 270 sq. ft. in a technical physics laboratory; the average over a range which includes biology, chemistry, engineering and atomic energy being 231 sq. ft. per person. Laboratories of the Department of Scientific and Industrial Research in this country covering subjects like radio, water pollution, food, pest infestation and general chemical research average 240 sq. ft. of useful space per worker. These figures may be taken as a very rough means of arriving at the overall size of a laboratory building for a known or estimated number of workers.

Adaptability. With the techniques for building and provision of services now available it is possible to obtain a high degree of flexibility in the movement of partitions, benches and connections to services, but at a cost of perhaps up to 15 per cent extra if almost infinite flexibility is demanded. Inflexible, monumental laboratory buildings are a poor long-term asset and a flexible one a good asset.

Offices. The relationship of office to laboratory space needs careful consideration. The expression 'office' really means writing space; for assistant staff, and the younger research worker, it is better to provide tables in the laboratory than separate office accommodation. For the senior research worker and section leaders, separate offices without laboratory services, which may therefore be across a corridor from the laboratories, are usually required, but in some cases they may be of the nature of private laboratories. The proportions depend on the nature of the work and the organisational structure of the staff. It should be remembered that serviced laboratory space is comparatively expensive, so that accommodation which does not need the services should so far as possible be kept separate from it.

Special 'Service' Laboratories. Service laboratories fall broadly into two categories:

(i) those providing special services, e.g. analysis, X-ray work, tracer element work, mechanical or electrical computing, and photographic services, etc., and occupied by the staff groups involved;

(ii) those providing special conditions of humidity, temperature, etc., and often used by the staff at large.

The immediate requirements for the first group are likely to be known fairly precisely and on that account they are perhaps specially apt to be planned rather more

* The papers and discussions are being published in the complete Proceedings of the Symposium by H.M.S.O.

[1] J. Lorne Gray. *Report on Space Requirements for Scientific Laboratories* (National Research Council of Canada. No. 1913, January 1949).

inflexibly than is really needed, imposing restrictions on design that are not essential.

The second group consists of rooms requiring special air-conditioning. This type of requirement is expensive and for abnormal conditions, e.g. humidities close to but below full saturation, it is unwise to rely on the maintenance of closely controlled conditions in a large room. If a high degree of control is required, it is preferable to rely on smaller laboratory cabinets.

Stores and Storage Space. No general guide can be given, but a number of different requirements can be identified.

(i) The main stores, which accepts and stores manufactured goods and equipment. This requires a substantial building with adequate heating.

(ii) Bulk storage for crude or raw materials which must be protected from the weather, but which requires little more than shed-type accommodation.

(iii) Storage of bulk samples for materials used in relatively large quantities or for large specimens that it is necessary to retain for at least a period. It is uneconomical to use space in an expensive laboratory building for this purpose, but it is usually desirable that each section or unit should have its own storage space rather than that all should share common accommodation. Probably something akin to a set of lock-up garages meets the need most conveniently and economically.

Space for Pilot-Scale Work. Many research laboratories have need to carry research beyond the laboratory stage to pilot-scale development. The space requirements are greater than for laboratory work and the facilities needed differ. While adequate provision will be made in the design of a research laboratory for permanent heavy plant, there is evidence that some modern laboratories are handicapped by insufficient provision of space for 'mock-up' plant installed as required for limited periods of time.

Table I

Information needed when drawing up list of requirements for a new laboratory building

1. Nature of organisation	Structure of divisions and sections. Numbers of men and women on staff
2. Pattern of work	Fundamental research Applied research Pilot-plant scale development
3. Space in offices	(i) Separate from laboratories (ii) Adjacent to laboratories (iii) Partitioned off from general laboratory space
4. Space in laboratories	Sizes of individual rooms to be based on (i) numbers of staff or (ii) nature and quantities of apparatus and equipment Proportion of space to be devoted to Desk work Bench work Fume cupboards and special fittings Chemical, glass, and apparatus storage
5. Space in special rooms	Constant temperature rooms Cold rooms Variable humidity rooms Balance and microscope rooms Dark rooms X-ray rooms Other special rooms
6. Space for other requirements ..	Stores and storage Pilot scale work Rough preparation work Workshops
7. Space for ancillary accommodation	First-aid, rest rooms, locker rooms, etc.
8. Degree of adaptability	Are major changes of function likely? Are any sections expected to expand, or contract?
9. Services	Electricity—capacity and supply Gas Water Vacuum Compressed air Drainage Extraction of fumes Other services
10. Internal environment	Heating Ventilating Lighting Decoration

A single-storey building with adequate clear height and a concrete floor generally meets the needs. Adequate power supplies should be provided at one or two fixed points and temporary leads taken to the plant unless this is of a permanent nature. Heating is most economically provided by local and movable sources. The width of the doors should be sufficient to allow access of a lorry. When the plant used is likely to remain permanently in position the necessary special foundations can be detailed at the design stage, but otherwise provision can be made for bolting plant to the floor. The structure can be a light frame provided no loads need be carried on the walls and that lifting may be done by lifting tackle. The necessity for an overhead crane needs examination, for the additional cost in the structure of the building and the crane is not inconsiderable. Pilot plants consume and produce substantial quantities of materials and provision is needed for loading, unloading and storage.

Lighting. The condition which most closely affects the plan form of a laboratory is that of daylighting. The Division for Architectural Studies of the Nuffield Foundation has recently completed a report[1] on lighting based on observations made in some of the laboratories of the Agricultural Research Council. This recommends that the basic level of illumination should be of the order of 15 lumens per sq. ft. on working planes, the general lighting being supplemented by adjustable local lighting for special tasks. The daylight factor recommended is three per cent for close detail, with some falling off from this for less exacting work, though experience at the Building Research Station suggests that it should nowhere be less than 2 per cent. It is however not necessary for this to be achieved wholly by daylighting, and it may in some circumstances be beneficial to the plan, and possibly to the arrangement of windows in the façades, to provide for a mixture of day and artificial lighting as the normal daytime illumination. Light from north-facing windows is preferred by many laboratory workers. Windows on other faces should be equipped with adjustable protection from sunshine, and all windows should be designed to minimise the visual discomfort caused by sharp contrasts between light and dark areas within the field of view. Artificial lighting is still a controversial subject about which it is perhaps unwise to dogmatise. Experience at the Building Research Station indicates that when a good proportion of the total light emitted from the fittings—say up to 30 per cent—is directed upwards onto ceilings and walls which have been decorated in light-reflecting colours, the rooms appear bright and pleasant, in contrast to those lit only by downcast lighting, which tend to be gloomy and somewhat dispiriting. The fittings should be carefully designed to avoid dazzle; that is to say, the unshaded

[1] Unpublished report. 'Lighting in Laboratories', by J. Musgrove.

light source should not be visible to the eye at angles of elevation of less than 60°.

Heating and Ventilating. Heating and ventilating go hand in hand. Since they may be very expensive if exacting demands are made of them, it will be as well to assess accurately what degree of control is needed to avoid asking for more than is really necessary. At one end of a long scale of cost is the full plenum system of washed and heated—or cooled—air, working to fine limits of temperature and humidity; at the other, ordinary low pressure hot water in pipes and radiators, and three air changes an hour through the fume cupboards. Apart from the difficulty that pipes and radiators bedevil the siting of benches and the running of services, there is little to be said against them. But if the degree of flexibility called for in the internal arrangements allows for the creation of rooms anywhere they are required simply by moving preformed partitioning, there is the possibility that a room might be left, or formed, without any direct heating. This would lead to unevenness of temperature throughout the building and, inevitably, complaints. It may be overcome by floor, or perhaps ceiling, heating. The method to be adopted will depend on the advice of the heating engineer and the architect, but the client must make quite clear what service he wants. In most laboratories in the United Kingdom an internal temperature of 65° F approximately (i.e. within 4° or 5° either way) provides reasonable working conditions. Any special conditions should be detailed separately, together with the limits of variation allowable.

The Services. In a laboratory whose internal arrangements are unlikely to change, benches may be set in the required positions and services brought to outlets wherever they are needed, the pipes and cables being fixed to bench or structure as necessary. But the fixing of services to benching adds a formidable difficulty to the business of moving them, and this applies also to partitions. If therefore the laboratory is to be easily adaptable, some form of 'ring main' service run should be contrived, either around or within the perimeter walls of the building, or in ducts arranged in the thickness of the floor, with 'heads' for gas, water, electricity, drainage and such other ductable services as may be required, arranged at a regular series of fixed points.

One way to determine quickly and accurately all that is required of the new building is to form a small committee of the 'key' laboratory men, under a representative of the director, together with the engineer who will be responsible for maintenance of the new building, and if at all possible the architect. At some stage in the development of the plan, opportunities should be made to visit any other establishments there may be whose experience of providing accommodation is likely to be relevant. Such a reconnaissance should be made not too early, not too late.

Design, Construction and Layout of Laboratories

By H. A. Snow [*A*]

Superintending Architect, Ministry of Works

IT HAS BEEN said, with a good deal of truth, that no building can be a success unless its designer has thoroughly understood the essential purpose and function which it is to fulfil. Thus as one of the first tasks in the planning of any new building the architect must make a close study of the system or processes involved: space, plant and personnel requirements; problems of delivery, circulation, dispatch and the like.

It may be assumed that much of these data will have been provided by the client in the form of a written brief, but the architect must supplement the information by personal observation and enquiry, so that he may build up a clear mental picture of the essential requirements.

This initial fact-finding process is complicated in the case of research laboratory design in that there is no firm basis from which to start. Research is never static; it is constantly changing in both direction and scope, and a brief based on the immediate requirements at any given moment in time would almost certainly be inapplicable when, months or years later, the new laboratory reaches physical completion.

To overcome this difficulty one should (1) forecast as accurately as possible future developments in the particular field of research concerned; (2) 'fix' the stage to which research may be expected to have advanced by the estimated completion date of the new laboratory, and (3) base the detailed schedule of requirements for the building on (2) above.

Accurate short-range prediction will ensure that the pattern of research will dovetail precisely with the accommodation and facilities provided by a new laboratory *at the time of completion*. Long-term prediction—stated in terms of probable expansion requirements—provides valuable assistance to both architect and engineer in planning the overall building and service layouts.

Clearly, only the director can possess the wider knowledge necessary to forecast the course and timing of research development, and it is upon him therefore that the architect must rely for a brief, not only full and informative in detail but also reflecting the forecast developments. The rapid and continual rise in building and engineering costs brings into sharp relief the need for economy in design, and the majority of research laboratories—especially if built with public funds—are peculiarly susceptible to charges of extravagance, however ill-founded. It is the duty of both architect and engineer therefore to examine critically the detailed schedule of requirements for a proposed laboratory, and to put forward for the director's consideration any practical alternatives whereby economies in building or plant costs might be made. The importance of economy in laboratory design, and some means of contributing towards it, are touched upon elsewhere in this paper, but it is perhaps appropriate to emphasise here that real economy starts with the director's schedule of requirements, and from the moment the designer first puts pencil to paper.

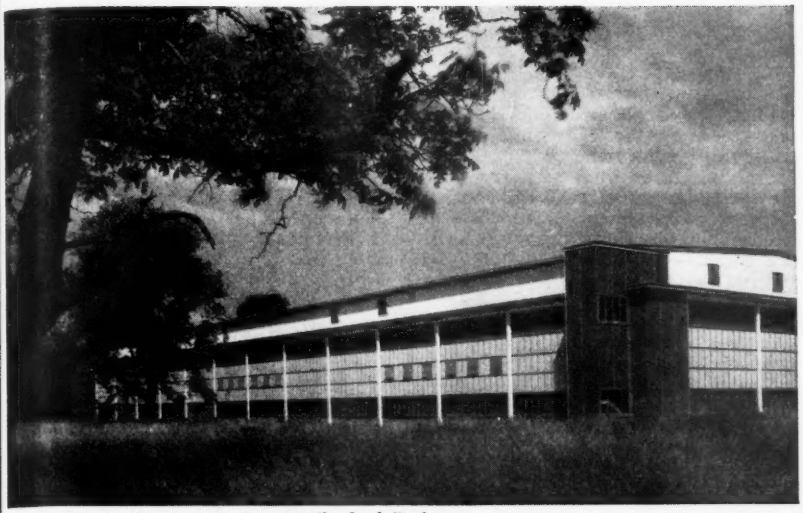
Layout. In planning the larger type of laboratory, consisting possibly of a number of different divisions, the question arises as to whether all principal units should be grouped together in one close-knit block or dispersed into divisional units (though still as parts of a correlated whole).

Some directors hold most strongly to the view that close-knit planning is essential as only by this means can proper control of the organisation be ensured. The validity of this argument is open to question, especially when it is remembered that the larger research establishments, such as Farnborough or Harwell, appear to function efficiently despite their vast size. The decision in my view should turn on the question of economics and upon what is the most suitable arrangement to meet site conditions. The open layout is more appropriate to a hilly site—it avoids expensive under-building, can be moulded more effectively to the contours of the land, and facilitates future extension. Among its disadvantages are longer (and therefore more costly) roads, paths and services.

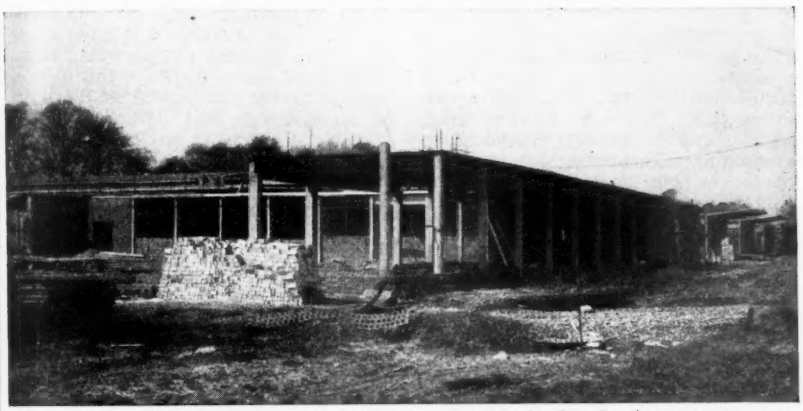
Whilst the single-block plan may be a more economical proposition on level ground by reason of shorter services and communications, it presents technical problems which may well involve extra cost in other directions. The principal objection to this form of planning however lies in the restrictions which it imposes upon future expansion.

Whatever form the proposed laboratory may take, there is a fundamental lesson to be drawn from past mistakes which architect and scientist alike must heed. This is the supreme importance of preparing at the *outset* a master plan which lays down the general lines of development for the future. Such a master plan must, above all, be flexible; it should not (and indeed could not) attempt to lay down more than the broad outline of future development, leaving details to be filled in as occasion demands. What it does ensure is that development over the years will follow an orderly path and that mistakes in siting new buildings, roads and services will be avoided.

There is no all-embracing formula for the actual process of laying out a new laboratory plan. Technical requirements must naturally predominate, but size, shape and configuration of the land, means of access, orientation and various other factors will all influence the designer in shaping his scheme. Fundamental precau-



The Hydraulics Research Station, Wallingford, Berks.



Progress photo of the Radio Research Laboratory, Datchet, Bucks, showing concrete posts, tubular steel trusses and deck roof [*Photos: Ministry of Works*

tions, such as the siting of noisy workshops, noxious processes, boiler-house, etc. away from the main body of the laboratory will be taken as a matter of course. Similarly, laboratories equipped with balances or other delicate instruments will be located as far as possible from concentrations of heavy plant or traffic.

In any development scheme, the imaginative designer will be concerned not only to preserve and integrate existing amenities—trees, hedges, streams and the like—but also to create others, so far as lies within his power. Careful attention will be directed to the grouping of the various units, distance between buildings in relation to their height, formation and layout of permanent open spaces, tree planting, and so on. It should be mentioned in passing that much of the value of such amenities will be lost unless proper care is taken to maintain them in the future. The combination of well designed and efficient buildings, good layout and pleasant surroundings must inevitably exert a beneficial influence upon the work of the laboratory. In addition it may contribute towards the attraction of scientists into the field of research—at the present time a matter of national concern.

Design of Buildings. Assuming that the site has been selected and that the architect has (1) studied the detailed requirements and gained a close insight into the functions of the laboratory, and (2) given some preliminary thought to the general layout, the business of transmuting words, figures and descriptions through the intermediate drawings stage into actual buildings can go forward.

Where the laboratory equipment involves special engineering plant the architect will wish to consult with his engineering colleagues in the very early stages of design. In such cases there is much to be said for setting up a joint design team consisting of architect, engineer and representatives of the director, so that all aspects of the scheme can be kept under continual review as design work proceeds. This policy has been successfully adopted by the Ministry of Works and also by various private concerns.

However exhaustive the preliminary study, it is not to be expected that the first sketch plans will meet with universal approval. At this stage the director and his staff should scrutinise the sketch plans with the utmost care and thoroughness, following which the architect can be given a detailed list of any modifications or additions desired. The director should clearly understand the vital importance of making known at this juncture *all* basic objections to the sketch plan proposals. If he does so the agreed amendments will be duly incorporated in the final sketch plans, to which in turn only very minor modifications ought to be necessary. If however he asks for further alterations each time an amended set of sketch plans is presented, the result is to delay the actual start of building indefinitely, besides causing unnecessary drawing work.

An important influence in determining design principles for any given laboratory building is the degree of flexibility which the director may require. In some instances it may only be necessary to ensure that the building can be extended (either laterally or vertically or both) should the need arise. Traditional construction, using load-bearing brick external walls, brick or hollow tile partitions and concrete floors, can suitably be used in such cases (although it may be prudent to design in such a way that partitions can, if necessary, be removed without affecting the structure). Sometimes a much higher degree of flexibility is called for, involving completely demountable internal partitioning, benches and fittings; in such cases steel or concrete frame construction is essential.

An example of this type of building is the proposed new chemistry laboratory for the Building Research Station, Watford. The building is planned on a 40-in. grid, both horizontally and vertically; the three upper floors (each 6,400 superficial ft. in area) are designed as clear laboratory space. Light partition panels may be erected at any position on the 40-in. grid; benches, fume cupboards and other fittings can be arranged to suit, and connections to all services will be available at 10 ft. centres. By means of a heated ceiling, evenly distributed warmth will be provided over the whole laboratory area, irrespective of partition arrangements. Demountable lighting panels in the ceiling will ensure that adequate artificial lighting is provided to suit any arrangement of partitioning.

This building will normally accommodate twelve sections, each in the charge of a principal scientific officer. Should the director at any time require to expand or combine certain of the sections, the necessary physical rearrangement of accommodation could be readily (but not *too* readily) effected. This kind of flexibility is not necessarily so costly as may appear at first sight since, by careful planning initially, and using the 'diversity factor' which flexibility affords, it should be possible to reduce the total floor area below that which would otherwise be necessary.

One of the first decisions to be taken in the design of a new laboratory building is

the number of floors to be provided. Technical considerations will obviously rule out multi-storey buildings in certain cases but in others (for example, the ordinary small-scale physics or chemistry laboratory) 2- or 3-storey buildings can and should be accepted, especially where space is limited. Even where it is not, a degree of inconvenience is no justification for insisting upon single storey construction, which is more costly per sq. ft. of floor space than 2- or 3-storey buildings. Economies apart, the careful grouping of single and multi-storey buildings on the site greatly enhances architectural effect and lends interest to the scheme as a whole.

As part of the day-to-day running of a research laboratory, there is bound to be considerable movement of materials or equipment within individual buildings. If for this purpose trolleys are to be used, then door and corridor widths must be suitably dimensioned and means provided for vertical movement between floors (if necessary).

Construction. The form of construction most suited to a particular laboratory building must largely be determined by technical requirements (including the degree of flexibility), cost, and architectural considerations.

For the smaller laboratory, load-bearing external walls with concrete floors and roof provide a satisfactory and economical solution especially as—by the use of prestressed concrete floor and roof units—clear spans of up to 40 ft. can be readily achieved. The extent of window area which can be provided however is necessarily limited.

A system of construction which has been successfully adopted for the new radio research laboratory at Datchet consists of precast concrete posts supporting light tubular steel roof trusses, carrying in turn a steel deck, insulated on its upper surface and finished with three-layer bituminous felt. The decking constitutes both ceiling and roof and an experimental area has been fitted with hot water pipes to form a heated ceiling.

In-filling to external walls between the posts consists of full width windows—giving maximum daylight to the laboratories—with cavity brickwork below. Internal partitions in this case are brick, since no special flexibility was demanded, but these are not load-bearing and could be removed very simply if required.

This form of construction has many advantages (not the least of which is speed of erection); it is not expensive and is particularly well adapted to the requirements of small-scale laboratories.

For the three-storey main block of the water pollution research laboratory at Stevenage the system of construction used was a combination of reinforced concrete frame and load-bearing brick walls. The upper floors and roofs were all of prestressed, precast reinforced concrete units bearing on both frame and walls. The concrete frame or grid was exposed externally, the panels being filled in by full width steel windows with vertical cedar boarding below, backed by insulating blocks.

In both the foregoing examples the electrical, gas, telephone and hot and cold water services, together with heating mains, were run in trenches under, or in false ceilings over, the main corridors. Distribution feeds were carried behind benches to outlet points, radiators or convectors in the individual rooms. Exhaust ducts from fume cupboards were run partly in specially created vertical casings and partly in false ceilings of corridors to deliver through grilles above roof level.

For the multi-storey laboratory, or where specially high structures are necessary to accommodate large-scale plant, fully framed construction will probably have to be adopted, using either reinforced concrete or steel. The projected chemistry laboratory at the Building Research Station at Watford (previously described) will be steel-framed. This was decided upon because the steel lattice girders supporting laboratory floors offer the maximum clear opening through which the network of service pipes (a product of flexibility) can be conveniently threaded. The floor construction will consist of accurately cast concrete panels, removable where required, to give access to services. Consideration was given to making the services accessible from below, but since this would have meant disorganisation of two floors in the event of rearrangement of one the idea was abandoned.

The question of what form of roof to adopt in any given scheme must again depend upon various considerations—architectural and technical—and needs no special comment except the advice (to architects) that flat roofs should never be designed to carry more than the minimum superficial load. This will ensure that attempts by scientists to place heavy and unsightly equipment on the roof—thereby destroying any architectural merit the building may possess—will be effectively discouraged. Superficial floor loading for the normal type of laboratory, i.e. where no special requirements or apparatus are involved, is usually taken at 60 lb. per sq. ft.

No general rules can be laid down for ceiling heights since this must depend upon room area and depth, height of any special apparatus, nature of the work to be carried out in the laboratory, daylight and other factors. For the average case, where no special equipment is required, a height of 9 ft. 6 in. from floor to ceiling would be a reasonable allowance.

Heating. A wide variety of heating systems has been used in different types of laboratories, ranging from full air conditioning and warming to hot water pipes fitted with aluminium alloy reflectors. Where ledges or dust pockets are unacceptable—for example, in tracer-element or biological laboratories—heated floors and ceilings may provide the best answer. A common arrangement is to install hot water convectors behind the rear casing of benches so that a current of air circulates over the heated surfaces and passes out through grilles in the bench top. (In such cases it is important to see that the grilles are not placed horizontally in the working section of a bench, to avoid risk of accidental spillage of liquids into the cavities.)

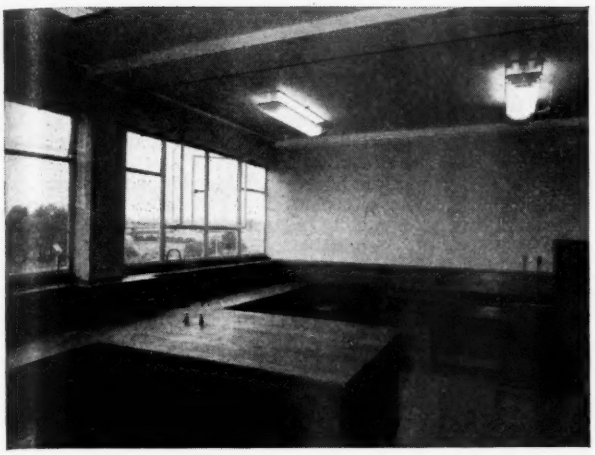
Buildings for pilot scale plant, workshops, stores and other large rooms of a semi-industrial character, where wall radiators may not be suitable or practicable, are more effectively heated by unit heaters suspended from the roof. These have the advantage of being directional and thus can be arranged to cover only those areas where heat is required.

An interesting departure from this practice was adopted in the large main hall at the hydraulics research laboratory, Wallingford, where a heated ceiling was used to allow a clear passage for the four camera transporters. This system provides comfortable working conditions although the heating plane is 25 ft. from floor level.

Artificial Lighting. Artificial illumination in small-scale laboratories is now almost universally provided by fluorescent tubes, much of the earlier dislike of this form of lighting having disappeared as the result of improvement and development. An intensity of from 15 to 20 lumens per sq. ft. at bench level may be regarded as normal in most laboratories, but where precision work is involved the general lighting should be supplemented by adjustable bench fittings.

Specially designed lighting fittings are required to meet the exceptional conditions found in research laboratories. Some of these must be capable of withstanding high or low temperatures; some, corrosion from acid fumes; others, extreme humidity or actual immersion. Lighting fittings for laboratories dealing with bacteriological or radio-active subjects must conform with the requirement usual in such conditions, i.e. that all ledges, crevices and other lodgments for radio-active dust must be eliminated. In situations where there is an explosive risk, lighting fittings are required to be flameproof, or alternatively placed outside the laboratory, illuminating it through sealed glass-fronted ports in the walls or roof. In neither case should control switches be located inside the laboratory. A requirement sometimes called for, especially in certain physics laboratories, is non-stroboscopic lighting provided either by three-phase current or the two-lamp system. Where for experimental techniques a constant supply is essential, a stand-by lighting system with automatic cut-in must be provided.

Drainage. The disposal of liquid wastes from laboratories should be considered at the site selection stage as it can present considerable difficulty. These wastes are often highly polluting and their discharge direct to water-courses is prohibited by the Rivers (Prevention of Pollution) Act 1951. Usually the most satisfactory form of treatment is in admixture with domestic sewage



Water Pollution Research Laboratory, Stevenage, Herts, main building and interior showing typical bench layout
[*Photos: Ministry of Works*

on a normal sewage disposal works, but local authorities need only accept these wastes by agreement under the Public Health (Drainage of Trade Premises) Act 1937. Unless the quantity of waste is small and the discharge is to a sewer carrying a considerable flow, some form of pre-treatment will be necessary. For this reason chemical wastes should be kept separate from other drainage and the volume should be reduced as much as possible to facilitate treatment.

Where radio-active waste is involved however, no authority would be prepared to receive it unless the degree of radio-activity were very low and then only subject to strict safeguards. In such cases the effluent is segregated from the remainder of the chemical wastes, is run to special holding tanks and in due season removed by a competent agency for disposal by authorised means.

The collection and conveyance of chemical wastes from the laboratory to the point of disposal needs special attention. Materials that are proof against corrosion from acids, alkalis and solvents must be chosen, and the choice will depend on the particular waste to be carried. Each case must be treated on its merits. Stainless steel, polythene, PVC, chemical lead and acid-resisting stoneware have all been used with success. Stoneware pipes have a high degree of resistance to corrosion, but are difficult to joint. High alumina cement has been used for this purpose for mild dilute wastes, and resin cements for more concentrated ones, but there are many other materials which would be equally successful.

Generous ducts should be provided for the pipework within the building and it may be wise with highly corrosive wastes to provide ducts for external drainage also.

For any laboratory discharging chemical or other 'trade' waste, the importance of a correctly designed drainage system is obvious, since rapid corrosion (if not guarded against) would be an extremely serious matter. This subject, which covers a wide field, is fully dealt with in a paper by R. T. Gillet, presented to the Institution of Public Health Engineers in March 1955.[1]

Finishings and Fittings. When it is realised that the items coming under this head—plastering, wall tiling, floor finishings, decoration, benches, fume cupboards and the like—may account for over 20 per cent of the total cost of a laboratory building, the importance of a critical approach to their design or selection becomes clear. Standards of finish which are pitched too high serve only to inflate costs without adding in the least to the facilities or general efficiency of a laboratory. At the same time standards must not be depressed to the point where they exercise an adverse psychological effect upon the occupants.

In what circumstances, for example, should walls and ceilings be plastered? Clearly it would be inappropriate to do so in bulk stores, garages, workshops and the like, but equally clearly there is every justification for a smooth plaster finish to interior surfaces of laboratories concerned with (for example) medical research, microbiology or radioactivity. Between these extremes lies a range of laboratories, quasi-laboratories and ancillary buildings where the issue is not so easily decided; where each must be considered strictly on its merits and in the light of processes involved. The rule should be that unless a sound case can be made out for it, plastering ought not to be used; brick or concrete surfaces should be finished 'fair-faced' and treated with gloss paint, emulsion paint or distemper as appropriate. Even where individual rooms *are* plastered it does not follow that corridors or staircases giving access to them need be similarly finished. These may often be left fair-faced and painted or distempered.

The selection of floor—as of wall and ceiling—finishes also calls for care and discretion. Industrial-type rooms or buildings (which may be taken to include most pilot scale laboratories) usually call for no more than concrete or granolithic floor finishes, although in joinery and metal working shops wood block flooring is often advocated (as being less liable to damage expensive machine tools accidentally dropped upon it). It is a common complaint however that woodblock flooring is slippery and therefore dangerous in proximity to moving machinery.

The average laboratory floor finish is subject not only to normal wear by personnel, trolleys, etc., but also to attack by spilt chemicals. Probably the ideal flooring is teak, but this is not always possible on account of its high initial cost. Many makes of jointless flooring (for which it is claimed that they are unaffected by any but the most highly concentrated chemicals) are now available, and some of these show considerable promise. Few however can compare in price with good quality linoleum, which meets most of the requirements and in the event of serious damage by chemicals is sufficiently cheap to warrant removal and replacement of the area affected. Other floor finishes in general use are thermoplastic tiling, terrazzo, granolithic paving and quarry tiling.

[1] 'Corrosion Resisting Materials in Plumbing and Drainage for Chemical Wastes' by R. T. Gillet, B.Sc., A.M.I.C.E., M.R.San.I., A.M.I.Mun.E., F.I.P.H.E.

Advocacy of restraint in the choice of internal finishes is not to say that the buildings must be dull and uninspiring places in which to work. On the contrary, by bold and imaginative use of colour in decorative treatment it is possible to create an interesting, stimulating and even exciting atmosphere irrespective of the surface finishes used.

It is impossible, in a short paper, to discuss all the various special finishes required to meet the exceptional conditions obtaining in research laboratories. Such conditions include extremes of temperature, high humidity, X-ray emission, radioactivity, chemical fumes and corrosive liquids—to mention only a few. All these present their own problems, and call for special techniques in the composition and execution of the finishings adopted.

Benches developed for D.S.I.R. laboratories by the Ministry of Works usually finish 3 ft. from floor level to working plane, and 2 ft. 3 in. (single width). Skirtings 9 to 12 in. high at back of bench form a mounting for service outlets and instruments. Pipes, wiring and instrumentation cabling are accommodated in a cavity behind the skirting, the top of which is covered by a wood capping arranged (in appropriate cases) as an extension to internal window sills. Hot air grilles are fitted either into the skirting or the wood capping. Independent cupboard and drawer units can be inserted below the bench tops as required, but a continuous 12 in. deep cavity is maintained at the back for heating, drainage or other mains. Radiators or convectors may also be located in this cavity, spaced between cupboard units.

Bench tops are usually of solid oiled teak, which stands up well to the demands and hazards of laboratory routine, but plastic finishes on framed or solid blockboard backing are also widely used. A less expensive finish, suitable for use in non-chemical laboratories, is good quality linoleum based on blockboard. Bench sinks for normal small-scale research may range from fireclay to acid-resisting stoneware, but for photographic work lead-lined sinks and drainboards are provided. In exceptional cases stainless steel sinks may be required.

Special benches for balances and optical instruments are of slate, marble or other dense, inert material, supported on brick piers and based (where necessary) on independent foundation slabs insulated from the main structure of the building.

Fume cupboards vary in form and size, but basically consist of a teak frame having fixed plate glass panels at sides and back, and counter-balanced sliding sashes at front. (These, when raised, should not be less than 6 ft. from floor to underside of sash.) Acid-resisting plastic strips cover the internal jointing of the framework; the working bench—usually of slate and pierced for services and wastes—is set 3 ft. from the floor. Fumes are removed by extract fans in the upper part of the cabinet. These fans, and any internal lighting fittings, need to be specially protected against corrosion.

Book Reviews

Eric Mendelsohn, by *Arnold Whittick*. 2nd ed. 10¾ in. 219 pp. incl. illus. + 75 pls. and pp. of illus. Leonard Hill. 1956. £2 6*s*.

When Eric Mendelsohn died in 1953 his reputation, in this country at least, had touched low-water mark. It can and will rise again.

Mr. Rayner Banham in his penetrating study (ARCHITECTURAL REVIEW, August 1954) endeavoured to show in which respect Mendelsohn's work had been misunderstood; he thinks that with greater knowledge of 'what his achievement really amounted to' we will 'recognise that he was less a vulgarian than an original and a non-conformist'. But in his desire to show the many sides of Mendelsohn's development, he tends to underrate the basic unity of his work, and he seems to dismiss as irrelevant everything that Mendelsohn did after leaving Germany.

Mr. Whittick now presents a final version of a biography, first published in 1940, which includes the buildings Mendelsohn designed in the U.S.A. He is of course well equipped for this task. As the author of a comprehensive work on European architecture in the present century he commands an extensive knowledge of the background from which Mendelsohn's achievements grew. He is a fervent admirer, and he was in personal contact with Mendelsohn ever since 1937. It appears that he has visited every important Mendelsohn building in Germany, England, Palestine and the U.S.A., and his analysis of these buildings is authoritative and plainly in accordance with the architect's own interpretation. The illustrations are equally comprehensive, well selected and presented. The book furthermore contains extracts from lectures and, more revealing, letters. Could any biographer do more?

And yet the portrait which results from so much loving care does not convey an altogether compelling likeness. There is something about it which recalls the official photos of royalty.

Mendelsohn was a man of intense vitality, inspiring equally strong feelings of love and antipathy, sometimes in the same person and even at the same time. He could be arrogant, generous, mean, warm-hearted, sarcastic, expansive, a hard taskmaster and a true friend.

In a biography, such characteristics ought not to go unmentioned; and in Mendelsohn's case they seem to be particularly revealing, because, if I am not mistaken, they are apparent in his architecture also. *De mortuis nil nisi bonum* has never made vital biography.

One example may suffice. Of the Einstein Tower, Mr. Whittick says: 'It was conceived in reinforced concrete, and commenced in this material, but owing to the difficulty at the time of procuring sufficient quantities of cement it was continued in brick, of which the main body was built.' This is the official explanation. It avoids giving offence. In 1925 however Mendelsohn gave us a different version and one which tallies with his change of outlook at this period, upon which Mr. Banham lays so much stress. 'Never again!' he explained. 'We had to call in shipbuilders for the shuttering of those curved surfaces. Still,' he continued, 'it is a good thing the Tower has been built.'

Quite so: if Mendelsohn was mistaken in his idea of monolithic, sculptural malleability of concrete, yet reinforced concrete undoubtedly possesses similar qualities. He did not realise then that it was the shuttering which presented the problem—a problem which, to some extent, can now be overcome. The Tower was an anticipation, and the ten years of revolution in architecture to which it belongs know of more anticipations of this kind. Mendelsohn's romantic ideas of structural expression resulted in the hybrid structure of the Einstein Tower, just as the ideas of a new domestic architecture of Mies and Le Corbusier resulted in a number of uninhabitable villas. And, certainly, 'it is a good thing these buildings have been built'.

Mr. Whittick repeats many times an expression particularly dear to Mendelsohn, that a building should form 'an organic whole', but he does not make it sufficiently apparent that Mendelsohn—more, I think, than any other architect of the century—inscribed the fluid, dynamic masses of his buildings into one unbroken contour, where one surface grows without any break out of the other: the feature he called the 'cheese-cut'.

One could wish that Mr. Whittick's approach had been less cautious and restrained; but his caution has produced a comprehensive, clear and readable account: a monument to one who has so often been dismissed as yesterday's great man that one begins to wonder if his spirit may not be with us again tomorrow.

JULIUS POSENER

Marcel Breuer: Sun and Shadow. The philosophy of an architect, by *Peter Blake*, editor and author of notes. 10½ in. (printed ob.). (204) (206–2) pp. incl. pls. and other illus. Longmans. 1956. £2 10*s*.

Of the houses offered to the 20th-century world by Corbusier, Mies van der Rohe, Wright and Breuer, those of Marcel Breuer are by far the most lyrical, poised, and, in terms of contemporary living, the most complete.

I saw recently the two houses in Doldertal, Zürich, and my heart leapt to find them all that the photographs had promised—the true embodiment of the intelligent, informal but artistically disciplined life for which, in spite of every other form of craziness, Europe stands; and in them, as so often happens in movements of artistic resurgence, the whole story is apparent; so much so, that what follows after in America, inventive and never-failingly skilful as it is, just fails to do more than echo the first fine careless rapture.

Breuer is an essential part of the Bauhaus; technically inquisitive and highly competent, he has always represented to

me the truly optimistic, artistic type of architect, and his experimental furniture, like everything else he did, had a completeness and a grace that immediately recommended it; it was without strain; within the compass of a quite Mozartian creative capacity.

Small wonder that Gropius should wish to continue so fruitful an association in the country to which he was called, and what Breuer has done there in one after another most satisfying works in the scale that so well suits him, displayed in this fascinating book with many details and a running commentary of semi-philosophical explanations, makes America the gainer in the transaction.

I am not so happy about either the UNESCO building or the Rotterdam store, where for the first time he is working on a bigger scale involving quite another set of experiences. His Wheaton College Art Centre seems all of a piece; above this scale the grasp weakens, but he has far yet to go, thank goodness.

The book is beautifully produced and there is no more philosophy than can be balanced by good buildings; but if it is to be seen the long way of the page, it could, I believe, have had its spine on the left.

E. MAXWELL FRY [*F*]

Latin American Architecture Since 1945, by *Henry-Russell Hitchcock* (New York: Museum of Modern Art.) 9½ in. × 8¼ in. (202) pp. incl. pls. and pp. of illus. New York. 1955. $6.50.

This is another collection of pictures—a good one—illustrating 46 buildings by a score of architects. Some of the illustrations will be familiar to those of us who see the glossy magazines, but most of them are new.

The scope of the subject and the scholarship of the author ensure a stimulating book, but not even Professor Hitchcock can deal adequately with the remarkable achievements of ten Latin American countries and the American dependency of Puerto Rico in the space of 53 pages of text. No one however could do better than he, and his lucidity and ability to single out significant factors and influences make the best of an almost impossible task.

There is of course nothing inherently wrong with the idea of a picture book—this one would make a lovely birthday present—but surely much of the Latin American development has had more than enough photographic publicity. What is now needed is a more serious, major account of this development and the great creative spirit which underlies it. As Professor Hitchcock tersely remarks, 'architecture is still very much an art in Latin America'—in these technological days that is something worth writing about.

Some emphasis is given to the fact that many Latin American architects have completed their professional education in the United States, but it is interesting to observe that, of the twelve important Mexican designers and the nine Brazilians who are listed in the biographical notes, none did so.

GORDON GRAHAM [*A*]

The Changing Forms of Art, by *Patrick Heron.* 8½ in. xxiii + 290 pp. + (16) pp. of illus. Routledge and Kegan Paul. 1955. £1 8*s*.

Mr. Heron is a notable modern painter; advanced but not a total abstractionist. One can recognise objects in some of his pictures, while one is enchanted by their colour and the mystery in their composition. As well, he is an articulate artist. This book is a putting together of essays, articles and broadcast scripts written in the last seven years. It is not to be read rapidly; but the pithiness of the thought makes the volume one which any architect interested in modern art should read and, I hope, possess.

This is not the place to discuss those excellent chapters which deal with modern painting and analyse the work of Picasso, Braque, Bonnard, Vlaminck, Matisse, Soutine, Sutherland and a number of others. But it is important to refer in this Journal to the author's most interesting relation of painting today to contemporary architecture.

He traces this through Cubism and—in its extreme stage—the undue emphasis of the purely formal at the expense of associative elements. This tendency, in pictures, to suppress and even to eliminate all reference to external reality and any indication at all of a 'subject' is reflected in the work of modern architects by their dropping all the formal devices in detail invented and cultivated by their predecessors through the centuries. He claims that in painting we have come in sight of a desert of meaningless abstraction, and he detects already the beginning of a reaction—to a remarriage with poetry. Hence he is excited to know what will happen to architecture when painting has discarded extreme formalism. He wonders how the hard and brilliant face of a building by Le Corbusier, for instance, may be modified in the next decade or two. Though he admires the logic in the disposition of masses we show, the ruthlessness and sheerness of line, he seems to feel—like a few elderly architects—that this harsh asceticism is not enough. We have thrown away the element of intricacy with the resulting loss of a possible touch of mystery in design. Probably we shall never again do buildings dripping with ornament; but we may have some fun swinging the pendulum a little way back—to tick, at least, with Braque.

A. S. G. BUTLER [*F*]

Italy Builds. L'Italia Costruisce. Its modern architecture and native inheritance, etc., by *G. E. Kidder Smith.* 11 in. × 8½ in. 264 pp. incl. pls. and other illus. Architl. Press. 1955. £2 16*s*.

Italy Builds completes the trilogy begun with *Switzerland Builds* and *Sweden Builds* by the same author. Mr. Kidder Smith regards the present renaissance in Italian architecture as something which has sprung inevitably from the past—not the past considered as a mere parade of styles, but as demanding a series of varied solutions to spatial problems and thus producing an unbroken tradition of great buildings. Therefore he first deals with the rich field of indigenous architecture to be found in all parts of the country. A climate which has a variety of temperatures and meteorological conditions such as few countries in Europe experience has given birth to a native architecture in which varying local conditions are fully appreciated and directly expressed in natural materials. There follows a section on some of the peculiar features which have made Italian cities the delightful places they are—squares formal and informal, vertical accents and changes in level. Selected examples as diverse as the minute Piazza Umberto I at Capri and St. Peter's Square are examined and analysed in relationship to their sites and the towns in which they appear.

In considering contemporary buildings in Italy the text makes it clear that the author deals with a few outstanding buildings in a vast output, of which much is unfortunately mediocre. But how good they are, these buildings—free from clichés and full of an unsurpassed freshness and vitality! Strangely enough in only one of them, Gardella's clinic at Alessandria, is the pierced wall used with anything like the dramatic effect found in the farm buildings of northern Italy, of which there are several pages of illustrations. The book culminates with examples of the work of Nervi, the most important architect-engineer of the day.

This is a fascinating history book and encyclopaedia of Italian architecture in one volume, illustrated with a wealth of photographs, all to the high standard which we have come to expect from the author.

ARTHUR M. FOYLE [*F*]

Versailles, by *Ian Dunlop.* 9 in. 240 pp. text illus. B. T. Batsford. 1956. £1 10*s*.

Versailles has endured much from the hordes of authors who have written about it. Indeed it would be difficult to name half a dozen books on the Château worthy of their theme. For a very inexperienced writer to add another volume to these dismal acres of print would therefore seem to be inexcusably rash. In fact there is some justification for Batsford's claim that this is 'the best general account of Versailles in English'.

Ian Dunlop has written a straightforward history of the time and of the place, adroitly fitting the work of the architects, painters, decorators, cabinet-makers and gardeners into a remarkably vivid narrative, which at every stage reflects the court life of France in the 17th and 18th centuries. He is undoubtedly very well informed about French social history and sufficiently convincing in his treatment of architecture and her attendant arts to satisfy all but the most pernickety specialist. He has a talent for graphic description and his enthusiasm and sympathy for the period carry the reader with him. Architects and many laymen however will regret that a book which is on the whole intelligently illustrated should contain only one plan; and this one, Pierre le Pautre's celebrated engraving of the completed design for Versailles, is reproduced so small as to be useless to anybody

not already familiar with it. The Château of Versailles is after all a complicated group of buildings, difficult to describe adequately in words. How, for example, can one possibly follow the intricate relationship of the 'petits appartements du Roi' without at least a sketch of their layout?

Two other comments seem worth making. First, a pretty good knowledge of French is needed to appreciate this book to the full. The author, to be frank, seems just a bit self-conscious about his command of the language, and some readers may find his gallicisms and French quotations a little tiresome. Secondly—and this is a small point perhaps, but quite an important one—although the buildings themselves have mercifully (although until quite recent years, inexplicably) escaped serious damage, they are for the most part empty. The furnishings and furniture of stupendous grandeur, which combined with the magnificent clothes of the courtiers to give such dazzling life and colour to the palace, are gone. Unlike many writers on Versailles, Ian Dunlop is always aware of this and constantly emphasises the brilliant quality missing from the Château as we see it today. One hopes, for this reason, that his book will also be read in France, where there is a movement to revive the full splendour of the interior of the palace by making it a permanent national repository of furniture of the 17th and 18th centuries. Many of the important pieces once installed there have in any case been located in private and public collections, while the inventories of the Garde-meuble Royal, which have been very completely preserved, provide wonderfully detailed sources of information.

Sir Arthur Bryant contributes a foreword in terms extremely flattering to the young author, who has certainly written a creditable book. One has the impression that some day he may be capable of an important one.

J. C. P.

Magyar Építészet [Hungarian architecture] 1945–1955, issued by the *Union of Hungarian Architects*. 13 in. 430 pp. of illus. with some text. Budapest. Képzömüveszeti Alap Kiadóvállalata. 1955.

Before the last war Hungarian architecture followed two distinct roads. The official architects of the semi-fascist régime tended to perpetuate 19th-century eclecticism and neo-baroque architecture while the more progressive section of the profession was influenced by the modern architecture of the west but mainly carried on the native modern architectural tradition, which had a number of eminent exponents ever since the first decades of this century.

It was these progressive architects who gained the upper hand when the new régime was established. They got to work and their achievements rank with the best in Europe from every point of view. This period lasted from 1944 to 1951. In the autumn of that year the first Hungarian Congress of Architecture was held, at which the architecture of the previous five or six years was violently attacked and condemned. It was decided at this Congress that architecture was to be 'national in form and socialist in content'. Architects were advised to study the achievements of Soviet architecture and town planning and to derive inspiration from them, and further to steep themselves in architecture of the Hungarian past. These recommendations were apparently misinterpreted and in the spring of 1954 the Conference of the Union of Architects condemned the achievements of the past three years. It was pointed out 'that an architecture which copies that of a different period, a different people, the architectural forms and expressions of a different region, cannot be successful. The socialist-realist architecture must reflect the socialist life, in accordance with place, people and circumstances. . . . ' Thus the directions of architecture changed again. The results of this last change are not yet visible.

Hungarian architecture of these last ten years falls into three parts: 1945–1951 the period of reconstruction and brilliant invention; 1951–1954 a period the architecture of which is hard to distinguish from that of the pre-war official architecture; and the new period which started in the spring of 1954, the results of which are not yet discernible.

The book is lavishly produced; the plans and especially the photographs are first rate. It seems odd that the pages are not numbered; there is no index, and it is regrettable that the dates of the buildings are not given. It gives nevertheless a grandiose impression of the last ten years of achievement of Hungarian architects, battling first with overwhelming physical odds and later against incomprehensible ideological directives.

ERNO GOLDFINGER [*L*]

Old London Churches, by *Elizabeth* and *Wayland Young*. 10 in. [330] pp. + 64 pls. and pp. of illus. Faber & Faber. 1956. £3 3*s*.

Now that the churches damaged during the late war have been, or are being, either rebuilt or restored or demolished and superseded, it is opportune that a fresh and comprehensive survey should appear. As compared with the last considerable work—Gerald Cobb's *The Old Churches of London*, 1941, etc.—which was almost confined to the City and systematic in scheme, this compilation, much more ambitious in scope and get-up, includes the whole of the county, and chiefly records individual buildings in topographical order. More valuable still, it includes (Roman) Catholic and Nonconformist examples as well as Anglican. 'No church founded later than 1830' is professedly included, but many later buildings of that parentage fortunately appear; the King's Weigh House church, Mayfair (1891, but founded 1662), is one that does not; the present buildings might with advantage be more adequately described (e.g. Christ Church, North Brixton, is not accredited to Beresford Pite). Information on churches destroyed and not rebuilt is usefully given, though their sites (e.g. that of St. Andrew Hubbard) are not always explicitly indicated.

Errors so far found are few ('Erechtheium' for '-eion' or '-eum', 'Horsleydown' for 'Horsely-', and 'Myddleton' for 'Myddelton'). There are an outline map showing boroughs and localities and a good index, in which however some place-names (useful to those uncertain of dedications) do not occur. Page-references are excellently given in captions. H. V. M. R.

Transactions of the *Ancient Monuments Society*, N.S., vol. 3. 8¼ in. Lond. (Clifford's Inn.) 1955. Available to subscribers.

The resumption of publication by this society has already been noted (JOURNAL, August 1955, p. 424). All that needs to be said of this third volume is that it is as comprehensive as its predecessor, with two general articles (on town planning and historic buildings, and on recording English architecture, by W. H. Godfrey [*F*]), two historical (Wales, and Durham cathedral restoration), two on fittings (changes in church furniture, and monument preservations), and one on heraldry.

A Guide to Current Practice 1955, by the *Institution of Heating and Ventilating Engineers*. [3rd ed.]. 9½ in. (xix) + 424 + xxviii pp. incl. illus. Lond. 1955. £3 5*s*.

Until the present the *Institution of Heating and Ventilating Engineers' Guide* was a loose-leaf production available only to members of the Institution. It has now been issued as a well-arranged volume for sale to the public, and is to be revised every three years. Included is a subject and author index to the Proceedings and Journal of the I.H.V.E. from 1899–1954. The advertisements, in classified order, make a convenient trade catalogue—a method which other learned societies whose publications accept advertisements might consider following.

Plastics in the Service of Man, by *V. E. Yarsley* and *E. G. Couzens*. (Pelican Books Series, A 272). 7¼ in. 315 pp. incl. pls. and other diags. + 16 pls. and pp. of illus. Harmondsworth: Penguin Books. 1956. 3*s*. 6*d*.

Synthetic plastics, being for the most part by-products of other industries, have developed variously as these sources became available. The factory designer who wishes to keep up to date with manufacturing processes will find it helpful to read Chapter III and study the relevant illustrations of structure and chemical composition. Processes in the same group vary in the degree of hazard involved.

Not all new plastics materials have 'taken on' equally well with the public, e.g. the celluloid collar and cuff is still preferred for its whiteness to another plastic equally spongeable but less inflammable. This lack of discrimination has embarrassed the industry which, faced with the failures of the immediate post-war years, has had to introduce stringent quality controls. That for P.V.C. sheeting for garments must have

been the first B.S. to be launched with a mannequin parade!

It would have been interesting to learn more about the efforts to control the use of inflammable nitrate film in the photographic industry, as in this case control of storage and use had to be exerted over a long period from outside the industry to obtain the substitution of tri-acetate film.

The book includes sections dealing with the physical properties, sources of raw material and manufacture of each individual group. It is illustrated by 28 clear figures and a number of photographic plates. The paper cover bears a plastics lamination.

C. J. SEARLE [*A*]

Builders' Materials, by *Bernard H. Knight* and *Rena G. Knight*. 3rd ed. 8¼ in. viii + 304 pp. incl. illus. Arnold. 1955. £1 10*s*.

The second edition of this well-known book, which is intended for the practitioner as well as the student preparing for professional examinations, appeared in 1948. The evolution of building techniques since the war has been so rapid however that a large part of the text has had to be rewritten and six new chapters have been added. These deal with (*a*) wall, floor, roof and ceiling linings, (*b*) iron, steel and steel alloys, (*c*) non-ferrous metals, (*d*) asphalts, plastics, adhesives and glass, (*e*) decorative materials and (*f*) comfort criteria. An appendix includes the relevant bye-laws, the weights of building materials and the more important British Standards and Codes of Practice.

More Advanced Quantity Surveying, by *Arthur J. Willis*. 5th ed. text vol. 9¾ in., x + 291 pp., incl. illus.; pls., xvi folding pls. 9¾ in., in case. Crosby Lockwood. 1956. £1 15*s*.

The Measurement of Prestressed Concrete. An extract from *More Advanced, Etc.* (5th ed.) 10 in. 15 pp. + folding pl. Crosby Lockwood. 1956. 6*s*.

It is perhaps a little presumptuous to review a book by such an established authority as Mr. Willis, but since the fourth edition in 1948 he has taken the opportunity to bring the book completely up to date. The latest edition has not only given the writer an opportunity of even further improving the body of the work, but there is now added a new chapter, 'The Measurement of Prestressed Concrete' (which can be purchased separately for 6*s*.) An excellent idea is having all the plates (sixteen in all, and very clear) of a standard size and in a separate case; a great improvement for reference whilst reading.

Naturally this book does not deal with work normally undertaken these days by architects (anyhow in the south of England), but for those architects who aspire to be quantity surveyors as well the book is invaluable.

It is interesting to note that the author has included in the existing chapters a number of comments and explanations which have been sent to him by his readers. In making comparison between the new and the previous edition it is very clear that Mr. Willis has gone into this aspect very thoroughly. He has been wise in deciding not to rewrite his book to cover new materials used in 'contemporary architecture', and it is agreed that the new styles of construction in no way affect the established principles of measurement.

It is perhaps a pity that Mr. Willis has not been able to incorporate any revisions to the Standard Method of Measurement which arise from the contemplated new edition. If the revised S.M.M. is changed considerably, necessitating renumbering the items, the author will, I fear, be required to do more than issue the 'after-sales service' to which he refers.

In conclusion, Mr. Willis and the publishers are to be congratulated on keeping the price down to that of the previous edition, which it is certain will be appreciated by students.

L. A. C. and S. W. A.

Practice Notes

Edited by Charles Woodward[*A*]

APPEALS AGAINST PLANNING CONDITIONS. In the JOURNAL OF PLANNING AND PROPERTY LAW for September there is an interesting decision of the Minister on an appeal against conditions imposed by a planning authority.

In this case permission was granted for development for residential purposes subject to a condition requiring the construction of a service road to serve those houses fronting a classified road. The owner sold the plots but made no provision in the conveyance for the construction of the service road. The individual plot holders applied for permission to erect houses or bungalows on the plots and the submitted plans in all cases except one showed the service road as contemplated by the condition on the original application.

Unconditional permission was granted in each case except that where the service road was not shown on the submitted plan a condition was imposed that no access should be opened on to the classified road except by way of the service road.

The houses and bungalows were erected, but each owner formed an individual access on to the classified road.

The planning authority were about to commence enforcement proceedings requiring the closure of the individual accesses and the construction of the service road, when several of the plot owners applied for permission to retain the individual accesses. Permission was refused by the planning authority.

In allowing the appeal of the plot owners the Minister said: 'It is improper to require the construction of a service road in connection with an application for permission to erect a single dwelling, since the applicant has no power to force other plot holders to build their parts of the road nor has the council power to require the applicant to give access to other people over his land. Permission has therefore been granted for development of land which has no owner's right of access except on the highway frontage, and to attempt to deny to the owner a direct access on to the highway is tantamount to denying him access altogether for the purpose of the development permitted.'

In another case reported in THE ESTATES GAZETTE for 29 September, the Minister dismissed an appeal from a decision of a local planning authority who refused permission for a bungalow to be built on land at the rear of a two-storey house. The curtilage of the two-storey house was large enough for two dwellings.

The local planning authority took the view that to erect the bungalow on back land without frontage to the highway would be detrimental to amenity. If a second house was to be built on the site it should be at the side of the two-storey house and not at the bottom of the garden.

In dismissing the appeal the Minister said that the building of a house behind another without proper road frontage is undesirable and should not ordinarily be permitted. Whilst he noted the applicant's personal reasons for wishing to build in that manner, he did not consider that the circumstances warranted an exception in this case.

GREEN BELT AROUND LONDON. The London County Council have prepared a booklet which traces the various stages of the evolution of the 'Green Belt around London' from 1930 up to the present time.

The booklet is issued from the Press and Information Division, The County Hall, London, S.E.1.

OPEN SPACES. The Ministry of Housing and Local Government have issued a technical memorandum No. 6 which is supplementary to Circular 9/55, and is primarily concerned with a review of open space allocations in approved Development Plans. It also deals with survey problems which arise in the preparation of town maps.

THE ILLUMINATING ENGINEERING SOCIETY. Eyestrain in Cinemas. In the report of the Committee on eyestrain in cinemas dated June 1956 the following recommendations are made:

The wide screen techniques which have been adopted by the cinematograph industry are not yet stabilised in type or form, and if further developments are introduced to the public it may be necessary for the Committee to reconsider the position. In respect however of the current techniques it is recommended that

(1) In order to prevent undue discomfort and fatigue of the eye muscles when viewing cinema pictures, the angle of elevation subtended at the eyes of any seated viewer by the length of the vertical line dropped from the picture top-centre to the horizontal plane passing through the

viewer's eyes should not exceed 35 deg., the position of the viewer's eyes being assumed to be 42 in. above floor level and 6 in. in front of the back-rest of the seat.

(2) Effect should be given to Recommendation 1 in all premises erected or adapted as cinemas after the date of issue of these recommendations.

(3) Effect should be given to Recommendation 1 in premises which, at the date of the issue of these recommendations, are already in use as cinemas, except that where, for structural and economic reasons, it is not reasonably practical in such premises, including those used only occasionally for cinematograph exhibitions, to avoid exceeding the maximum angle specified in Recommendation 1, an increase in the angle of elevation to the picture top-centre may be permitted up to a maximum of 45 deg. provided that the angle of elevation to the mid-point of the picture does not then exceed 30 deg.

(4) During cinematograph exhibitions organised wholly or mainly for children in any premises as defined in Recommendations 2 and 3, effect should be given to Recommendation 1, if necessary by preventing occupation of any seats from which the angle of elevation of the picture top-centre exceeds 35 deg.

The Committee states that there is not sufficient evidence at present to justify the recommendation of a definite limit to the lateral angle of view and, accordingly, it is suggested that the 1920 recommendations on this matter be waived for the time being.

Unsteadiness of the picture as a whole, abrupt changes in overall brightness, excessive brightness contrasts within the picture and poor definition are all features which, when present, excite 'compensatory' actions either of the external or the internal muscles of the eyes. They, together with the manifest unusualness of the visual stimuli provided by the pictures and the perceptual difficulties these may entail, create that sense of stress in seeing which is often complained of as 'eyestrain'.

METAL WINDOW PRICES. The Metal Window Association has, in accordance with its undertaking given on 26 January last, held firm the selling prices for standard metal windows for over six months.

The Association has now, in the light of the latest cost figures prepared by its independent cost accountants, revised its selling prices for standard metal windows in order to take into account the increases in cost and the economies in manufacture which have taken place. The effect is to increase the price of some windows and to reduce that of others.

These new prices came into force on 3 September 1956 and in respect of them the Association is prepared to give a further undertaking.

'Subject to unforeseen and exceptional circumstances, The Metal Window Association undertakes to hold the selling prices of standard metal windows firm for as long as possible and at least until the 1957 Budget.' (31 August 1956.)

NATIONAL JOINT COUNCIL FOR THE BUILDING INDUSTRY. Regrading of Districts. The Council have authorised the regrading of districts in the following counties as from 1 October:

Cornwall, Devonshire, Dorset, Gloucestershire, Herefordshire, Somerset and Wiltshire. The regrading is from A2 to A1. The list issued by the Council gives the towns which are regraded from A2 to A1 as from 1 October.

Certain towns in the Eastern Counties Region, the Midland Region, the South Wales Region, the Yorkshire Region, the North-Western Region, the Northern Counties Region, the Southern Counties Region, Buckinghamshire and Oxfordshire have been regraded as from 1 October from A2 to A1 and in some cases from A1 to A.

As from 4 February 1957, certain towns in the Southern Counties Region will be regraded from A2 to A1.

The effect of the regrading is to raise the hourly rate of operatives' wages and in current contracts will be a net addition to the Contract Sum under the R.I.B.A. Form of Contract.

(*Note*. The list of towns is too long to be reproduced in these Notes, but the regional offices of the National Joint Council would no doubt have copies of the list.)

LAW CASE

Whitcombe *v.* Pollock. Housing Act 1936. Calculation of rent. The plaintiff in this case was the tenant of a house in Liverpool, and the defendant was the landlord.

The house was let at a rent of 10*s*. a week. The plaintiff's wife was injured when part of an office floor gave way. Complaint had been made to the defendant of the dangerous condition of the floor.

The Housing Act 1936 provides that where a house is let at a rent not exceeding £26 a year (outside the County of London) there is an implied condition that the house at the commencement of the tenancy is in all respects reasonably fit for habitation and an undertaking by the landlord that the house will be so kept during the tenancy.

The plaintiff contended that a weekly rent of 10*s*. brought the house within the 1936 Act and that the defendant was liable. The defendant contended that on the basis of 365 days to a year the weekly rent of 10*s*. added up to a fraction over £26 a year and therefore the house was outside the 1936 Act.

It was held that the word 'rent' in the Act meant the actual contractual rent paid by the tenant, and that the proper method of ascertaining the annual rent was to multiply the weekly rent by 52, and not to make detailed calculations based on the number of days in a calendar year. The premises therefore came within the Act of 1936 and the plaintiff was entitled to succeed. (THE ESTATES GAZETTE, 15 September 1956. THE LAW JOURNAL, 31 August 1956.)

Correspondence

HIGH-DENSITY HOUSING SCHEMES IN EUROPE

The Editor, R.I.B.A. Journal

DEAR SIR,—I read with the greatest possible interest the first part of Mr. Jensen's Report (abridged) on High-Density Housing Schemes in Europe. There is in this part no direct evidence of high density, but much information about high building. I hope that the opening words of the paragraph on France will not be used as an excuse for withholding precise figures on density in Part II. Might I suggest that the measure of density might be in terms of the Report issued by the Ministry of Housing and Local Government in 1952 in which three definitions are given: Net Residential, Gross and Overall Density.

The rehousing that is taking place within the L.C.C. area at Wandsworth contains some high buildings but is at a low net residential density for that part of London, namely 75 persons per acre.

There are also some assumptions in the first column of Mr. Jensen's Report that need to be substantiated, especially the question of capital outlay.

Your obedient servant,

PATRICK ABERCROMBIE [F]

UNIVERSITY COLLEGE, LONDON

DEAR SIR,—I should be grateful if you would grant me a little space in your columns to try and make contact with old students of University College, London, of whom we calculate there must be some 30,000 either in this country or overseas. Unfortunately we have got records of the careers and up-to-date addresses of only a very small proportion of this number. The College authorities are anxious to get in touch with old students, to invite them when possible to appropriate College functions, and on occasion to seek their advice. It is only when some honour, public appearance or other matter is recorded in the press that the College can add to its records of the individual concerned.

The College authorities hope that old students will write, even just a postcard, to the Secretary of University College, London, Gower Street, London, W.C.1, giving their addresses, dates at College, and subjects studied, and will keep the Secretary informed of changes of address.

Yours faithfully,

IFOR EVANS,
Provost of University College, London

THE SIGN BOARD AND THE JOURNAL

SIR,—How right Mr. Brandon-Jones is—the new sign board is terrible—just look at the R of the lettering; but as its aesthetic level is just about that of the JOURNAL of the Institute perhaps it is typical.

Yours faithfully,

LOUIS OSMAN [F]

Review of Construction and Materials

This section gives technical and general information. The following bodies deal with specialised branches of research and will willingly answer inquiries.
The Director, The Building Research Station, Garston, near Watford, Herts. Telephone: Garston 2246.
The Officer-in-charge, The Building Research Station Scottish Laboratory, Thorntonhall, near Glasgow. Telephone: Busby 1171.
The Director, The Forest Products Research Laboratory, Princes Risborough, Bucks. Telephone: Princes Risborough 101.
The Director, the British Standards Institution, 2 Park Street, London, W.1 Telephone: Mayfair 9000.
The Director, The Building Centre, 26 Store Street, Tottenham Court Road, London, W.C.1. Telephone: Museum 5400 (10 lines).
The Director, The Scottish Building Centre, 425–7 Sauchiehall Street, Glasgow, C.2. Telephone: Douglas 0372.

Bristol Building Bureau. With the object of finding out what response there would be to the idea of forming a permanent Building Bureau in Bristol, a pilot scheme was held in the City Centre during July and part of August. That the pilot scheme aroused interest is shown by the fact that during the six and a half weeks it was open over 3,000 architects and building technicians visited it and 56 manufacturers and service organisations contributed displays. The Ministry of Works and the R.I.B.A. provided special exhibitions.

The intention was that if the pilot scheme proved successful and encouraging, a permanent Building Bureau should be set up in larger premises, to 'provide a place where architects, surveyors and building technicians can examine and evaluate building materials, services and equipment on their own and at their leisure'; much, indeed, as at the Building Centre in London.

The committee convening the pilot scheme feel that it indicated a genuine need for a Bureau in Bristol, and therefore it is proposed to make the committee more representative and to proceed to the opening of a permanent Bureau as soon as possible.

The director of the pilot scheme was Mr. Raymond Moxley [*A*] of 33 Park Street, Bristol, 1. The trustees are all members of the R.I.B.A.

Building Bulletin No. 9. Colour in School Buildings. This Bulletin issued by the Ministry of Education is a second edition; the first was published in 1953, and since that time the B.S.I. has published B.S. 2660: 1955, *Colours for Building and Decorative Paints*. From the 101 colours in the Standard, 54 have been selected, being those which experience suggests will be most useful for school buildings, and these are included in the Bulletin under the title 'Archrome 2' range; each colour being given the B.S. 2660 reference number and also the approximate Munsell reference. Two additions have been made in this second edition; a section on the design of reflected light, and one on the colour of floors.

The Bulletin stresses that although the revised range will be known as the Archrome 2 range it is not 'a Ministry of Education range', and that there is no question of the Ministry specifying its use in schools. Any local authority or private firm of architects will be free to use the range or not as they think fit.

Some of the points and suggestions made in the Bulletin are illustrated by sketch diagrams as well as can be done by line blocks and mechanical tints. The Bulletin ends with an appendix on terminology. H.M.S.O., price 5*s*.

Gas and the School Meals Service. This is the title of a booklet issued by the Gas Council, of 1 Grosvenor Place, London, S.W.1; it describes the size and type of apparatus recommended for schools of varying numbers of pupils, and with the aid of diagrammatic plans it gives advice on kitchen layouts. Photographs illustrate various existing installations. The Gas Council hopes that 'members of local authorities, architects and all concerned with education will find this booklet of great interest'.

The booklet makes reference to the Ministry of Education Building Bulletin No. 11, *The Design of School Kitchens*, and mentions that all gas appliances should conform to B.S. 2512: 1954, *Gas-heated Catering Equipment*, which contains particular reference to school canteens. Code of Practice 332,402, *Gas Cooking Installations* (*School Meals*) deals with the installation of appliances.

Escape from Fire. Fire Protection Bulletin *Escape from Fire*, dated September 1956, deals with structural means of escape and states that the principle on which the number and width of exits from each floor of a building are calculated is based on a unit of exit width of 1 ft 9 in., the discharge rate per unit of exit width being recognised as 40 persons per minute. The maximum time in which a building should be cleared is generally regarded as 2½ minutes, thus each unit width would allow 100 persons to escape in that time.

The Bulletin describes the principles governing the provision of fire separation and indicates the requirements for exits. Information is given on where to go for detailed advice on the legal aspects of fire safety or on the solution of specific problems. Diagrams are given.

The Bulletin can be obtained, free, on application to the Fire Protection Association, 15 Queen Street, London, E.C.4.

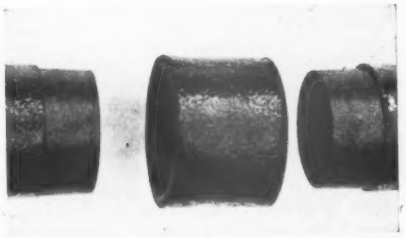
Pitch Fibre Pipes and Conduits. The Universal Asbestos Manufacturing Company Ltd. recently formed a subsidiary company under the title Union Fibre Pipes (Great Britain) Ltd. to manufacture pitch fibre pipes and conduits. Production began last September at the company's works at Harefield, Middlesex, and includes drain and sewer pipes, cable conduit, and perforated pipes for sewage disposal and land drains.

The pipes are made from wood cellulose fibre which is put with water into a paper beater and reduced to a pulp which, after it has been kept in a proper degree of suspension, is passed to the making machines that turn out jointless tubes of constant thickness; the tubes are then dried and are impregnated with hot pitch by a vacuum process. When the pitch has solidified each end of the tubes is machined to a 2 degree taper. Coupling collars are machined internally to the same taper. Jointing is done by slipping a coupling collar on the tapered end of the pipe and hammering it home, using a wooden 'dolly' to receive the blows. The tapered end of the next length of pipe is then inserted into the open side of the coupler and is hammered home into the coupler in the same manner. A close joint is thereby made without having to use any jointing material such as would be required for stoneware pipes.

The pipes are made in 8 ft. lengths and therefore there are fewer joints than there would be in the case of stoneware, thus lessening the time taken in laying, and they can be tested as soon as they have been laid. The pipes are available in 2, 3, 4, 5 and 6 in. internal diameters. Bends, junctions and similar fitments are available.

Pitch fibre is claimed to be unaffected by acid or alkali conditions, termites or fungus growths; it is tough and resilient and can therefore stand up to uneven ground settlement; nor can the joints be breached by tree roots.

The pitch fibre conduit is made in two grades, medium and heavy; perforated pipes for sewage disposal and land drains are pierced on each side with ½ in. holes at 5 in. centres, and are joined with snap couplers.



Tapered ends of pitch fibre pipes and a coupler

Clean Air. The Clean Air Act received the Royal Assent on 5 July of this year, and therefore the subject becomes one that must receive the attention of industrialists and householders, and in both these fields the architect is concerned. As soon as the legislation was foreshadowed the Leeds Chamber of Commerce appreciated that industrialists as well as domestic users would welcome some guidance on the requirements to be observed and the methods of doing so. Accordingly the Chamber began the preparation of a supplement to the September issue of the LEEDS JOURNAL.

The main purposes of the Clean Air Act are (*a*) to prohibit the emission of dark smoke from chimneys, railway engines and vessels, subject to certain qualifications; (*b*) to prohibit the installation of new industrial furnaces unless they are capable, so far as practicable, of being operated without emitting smoke; (*c*) to require that the emission of grit and dust from existing furnaces shall be minimised, and that new industrial furnaces burning pulverised fuel or substantial quantities of other solid fuel shall be provided with grit-arresting equipment; and (*d*) to empower local authorities by order, subject to confirmation by the Minister concerned, to declare 'smoke control areas', in which the emission of smoke from chimneys will constitute an offence. Although the Act does not extend to Northern Ireland the Parliament of Northern Ireland is given power to pass similar legislation.

The supplement first epitomises the various sections of the Act and then gives articles on the various aspects of the subject, written by the National Industrial Fuel Efficiency Service and by experts in particular branches of the matter. Reference is made to relevant British Standards.

There is also the Alkali Act, under which certain processes are scheduled as requiring registration, as there are some for which there are at present no known practicable means of preventing the emission of smoke or dark smoke or dust and grit. The Minister may use his powers under the Public Health (Smoke Abatement) Act 1926 to place such processes under the control of the Alkali Inspectorate, which is already dealing with the emission of noxious gases and fumes arising from processes scheduled under the Act.

'Clean Air' is the name given to this supplement to the LEEDS JOURNAL. Copies can be ordered from the Leeds Incorporated Chamber of Commerce, 9 Quebec Street, Leeds 1, at 5*s.* per copy for one to six copies, plus 4*d.* each postage, and at lessening rates for greater numbers.

Modern Lighting Fittings. How interesting it would be to look at an album containing illustrations of artificial light sources throughout the ages, from the wick in oil, through the candle, oil lamp, gas jet, incandescent gas mantle to the electric lamp in all its forms. No one worried about polar diagrams in the early days nor bothered much about seeing, or not

Lighting fitting by Messrs. Troughton & Young

seeing, the naked light source, but today the problem is how to utilise the light from an electric light bulb to the best advantage without allowing the eye to see the bulb itself.

Messrs. Troughton & Young (Lighting) Ltd., of 143 Knightsbridge, London, S.W.1, have recently issued their leaflet No. TYL/11 illustrating and describing their new range of lighting fittings, one of which we show here. As will be seen, the reflectors are equally spaced round the suspension rod but the finish of each is different, being respectively white, black, and Thames green. The suspension rod can be either satin brass or black bronze.

Building Research 1955. The Building Research Board, D.S.I.R., has published its report for the year 1955, including the report of the Director of Building Research. Among the many lines of research mentioned, all of them interesting, is that on the conversion and improvement of old dwellings, especially on the problem of dampness in buildings caused by lack of a damp-proof course. Investigations are proceeding on mechanical equipment for cutting brick walls so that a d.p.c. can be inserted, and on means of impregnating walls at damp-proof course level to prevent the rise of water.

Roof drainage by eaves gutters has been studied with the object of providing more satisfactory design data. Inspections of existing practice revealed that the fixing and maintenance of gutters were often poor, resulting in greatly reduced capacity. In some circumstances sloping guttering can provide over 50 per cent greater capacity than similar gutters laid level, the permissible slope being limited by the maximum gap between roof and gutter that will avoid roof water missing the gutter.

Officers of the Station have visited some Western European countries to survey the manufacture and use of large burnt-clay blocks, with a view to encouraging the use of them in this country. 'There is undoubtedly a need,' the report says, 'for brick manufacturers, architects and builders to become more aware of the potentialities of large hollow blocks, and first-hand evidence of experience on the Continent should help to remove the prejudice that appears to exist.'

The report is published by H.M.S.O., price 5*s.* net.

Colours for Building and Decorative Paints. In the JOURNAL of February 1955 a short history was given of the work of an R.I.B.A. committee on the preparation of a new range of colours for building to be submitted to the British Standards Institution with the object of its being incorporated in a British Standard, and the result was the publication of B.S. 2660: 1955, *Colours for Building and Decorative Paints*, which included cards bearing the selected colours. The Standard stated that 'Closer colour matching will normally be obtained by using the larger specimens of each colour, 5 in. by 2 in., which are available on separate cards'.

The B.S.I. has issued a reminder that factory-size specimens in accordance with B.S. 2660 are available for purchase. The specimens have been produced from the actual paints themselves and not from printing inks, and are therefore the best possible means of colour matching. Single cards are available at 1*s.* 6*d.* each, or the complete set of 101 for £7 7*s.* 0*d.*

Working Stresses for Structural Softwoods is the title of the Forest Products Research Bulletin No. 37. The document states that strength tests on small clear specimens of timber can be used in making comparisons between species but cannot be used directly to give safe working stresses.

Grading rules for home-grown softwoods have already been made, and the Bulletin shows how working stresses for the two structural grades in the rules can be derived from the result of tests on small clear specimens. A table sets out the permissible working stresses for nine of the most widely grown British softwoods and three of the imported ones most commonly used. H.M.S.O., price 1*s.* 3*d.* net.

British Standards Recently Published

B.S. 874: 1956. **Definitions of Heat Insulating Terms and Methods of Determining Thermal Conductivity.** Part 1 of this revised Standard contains definitions of heat insulating terms and a summarised list of relevant symbols and dimensions of units, with the object of establishing consistency in definition of terms and rectifying confusion which may exist in the use of such words as conduction, conductance and transmission. The joule has been adopted as the fundamental unit of heat.

A complete revision has been made of the methods used for measuring thermal conductivity, conductance and transmission of heat insulating materials and structures. Price 5*s.*

Notes and Notices

NOTICES

Inaugural General Meeting, Tuesday 6 November 1956 at 6 p.m. The Inaugural General Meeting of the Session 1956–57 will be held on Tuesday 6 November 1956 at 6 p.m. for the following purposes:

To read the Minutes of the Ninth General Meeting of the Session 1955–56 held on 16 June.

Mr. Kenneth M. B. Cross, M.A., President, to deliver his Inaugural Address.

To unveil the portrait of Mr. C. H. Aslin, C.B.E., Past President, by Mr. Allan Gwynne-Jones, D.S.O., A.R.A.

To present the London Architecture Bronze Medal 1955 to Mr. Frederick Gibberd, C.B.E., M.T.P.I. [*F*] for the Passenger Handling Building, Central Terminal Area, London Airport.

To present R.I.B.A. Awards for Distinction in Town Planning to Mr. Johnson Blackett [*F*], Dr. J. Leslie Martin, M.A. [*F*], Mr. Peter Shepheard, B.Arch., A.M.T.P.I., A.I.L.A. [*A*] and Mr. L. Hugh Wilson, O.B.E., A.M.T.P.I. [*A*].

(Light refreshments will be provided before the meeting.)

Classes of Retired Members. Under the provisions of Bye-law 15 applications may be received from those members who are eligible for transfer to the class of 'Retired Fellows', 'Retired Associates' or 'Retired Licentiates'.

The Bye-law is as follows: 'Any Fellow, Associate or Licentiate who has reached the age of 55 and has retired from practice may, subject to the approval of the Council, be transferred without election to the class of "Retired Fellows", "Retired Associates", or "Retired Licentiates", as the case may be, but in such case his interest in, or claim against the property of, the Royal Institute shall cease.

'The amount of the annual subscription payable by such "Retired Fellow", "Retired Associate" or "Retired Licentiate" shall be one guinea, or such amount as may be determined by resolution of the Council, excepting in the case of those who have paid subscriptions as full members for 30 years, and who shall be exempt from further payment. A "Retired Fellow", "Retired Associate" or "Retired Licentiate" shall have the right to use the affix of his class with the word "Retired" after it, shall be entitled to receive the JOURNAL and Kalendar, shall be entitled to the use of the Library, and shall have the right to attend General Meetings, but shall not be entitled to vote. A "Retired Fellow", "Retired Associate" or "Retired Licentiate" shall not engage in any avocation which in the opinion of the Council is inconsistent with that of architecture. Nothing contained in this Bye-law shall affect the rights of persons who at the date of the passing of this Bye-law are members of the classes of "Retired Fellows" and "Retired Members of the Society of Architects".'

Formal Admission of New Members at General Meetings. New members will be asked to notify the Secretary R.I.B.A. beforehand of the date of the General Meeting at which they desire to be introduced and a printed postcard will be sent to each newly elected member for this purpose. On arrival at the R.I.B.A. on the evening of the General Meeting new members must notify the office of their presence and will then take their places in the seats specially numbered and reserved for their use. On being asked to present themselves for formal admission, the new members will file out in turn into the left-hand aisle and after shaking hands with the President (or Chairman) will return to their seats by way of the centre aisle.

Formal admission will take place at all Ordinary General Meetings of the present Session, with the exception of the following:—6 November 1956, Inaugural Meeting; 5 February 1957, Presentation of Prizes; 9 April 1957, Presentation of Royal Gold Medal.

Correspondence with the Institute. In order to facilitate speedier attention to correspondence, and to relieve the staff of a great deal of research, it is particularly requested that members and Students will kindly state in all correspondence with the Institute the class of membership (*F, A, L* or *Student*) to which they belong.

Kalendar 1956–57: Corrections. In the new issue of the Kalendar which has just been published, the following errors occur:—

P. 97. Brandt: William Henry [*L*] should read **Brant:** William Henry.

P. 175. **Doe:** Donald Brian [*A*]. The address should read **Architect, P.W.D., Aden, S. Arabia.**

P. 427. **Powell:** Arnold Joseph Philip [*F*]. The telephone number should be ABBey **3156–8.**

CURRENT R.I.B.A. PUBLICATIONS

The following is a list of the main R.I.B.A. publications with their prices.

Agreement, Forms of

Form of Agreement for General Use between a Private Building Owner and an Architect or a Firm of Architects.

Form of Agreement for General Use between a Building Owner (being a Statutory Authority) and an Architect or a Firm of Architects.

Form of Agreement between a Local Authority and a Firm of Architects for Housing Work.

Form of Agreement between a Local Authority and a Firm of Architects for Multi-Storey Flats.

Form of Agreement between the Promoters and a Firm of Architects appointed as the Result of a Competition.

Price 6*d.* per form (inclusive of purchase tax). Postage 3*d.*

Architect and His Work, The

Price 6*d.* Postage 3*d.*

Before You Build. Free.

Certificates, Architects', Form Prepared by the Practice Committee

Copyright Book of 100 Certificates.

Price 17*s.* (inclusive of purchase tax). Postage 1*s.* 4*d.*

Conditions of Engagement and Scale of Professional Charges

Price 6*d.* Postage 3*d.*

Contract, Form of Agreement and Schedule of Conditions

For use with quantities: 1939 revised 1956. Copyright.

For use without quantities: 1939 revised 1956. Copyright.

Price 2*s.* 2*d.* per form (inclusive of purchase tax). Postage 4*d.*

Adapted for the use of Local Authorities, for use with quantities: 1939 revised 1956. Copyright.

Adapted for the use of Local Authorities, for use without quantities: 1939 revised 1956. Copyright.

Price 2*s.* 5½*d.* per form (inclusive of purchase tax). Postage 4*d.*

Fixed Fee Form of Prime Cost Contract for use in the repair of war-damaged property, 1946 revised 1956. Copyright.

Price 2*s.* 2*d.* (inclusive of purchase tax). Postage 4*d.*

Cost Plus Percentage Form of Prime Cost Contract for use in the repair of war-damaged property: 1946 revised 1956. Copyright.

Price 2*s.* 2*d.* (inclusive of purchase tax). Postage 4*d.*

Examination, Intermediate, Questions Set At

Price 1*s.* per examination. Postage 3*d.*

Examination, Professional Practice, Questions Set At

Price 6*d.* Postage 3*d.*

Examinations, Final and Special Final, Questions Set At

Price 1*s.* per examination. Postage 3*d.*

Forms of Articles of Pupilage

Copyright. Price 1*s.* 8*d.* (inclusive of purchase tax). Postage 3*d.*

Membership of the R.I.B.A.

Particulars of the Qualifications for Associateship.

Price 2*s.* 6*d.* Postage 4*d.*

Party Wall Notice Forms, for Use Under the London Building Act

Form A—Party Structures.

Form B—Party Fence Walls.

Form C—Intention to Build within Ten Feet and at a lower level than the bottom of the foundations of adjoining Owner's Building.

Form D—Intention to build within Twenty Feet of the adjoining Owner's Independent Building and to a depth as defined in Section 50(1)(b).

Form E—Party Walls and Party Fence Walls on line of Junction of adjoining lands.

Form F—Walls or Fence Walls on Building Owner's land with footings and foundations projecting into adjoining Owner's land.

Form G—Selection of Third Surveyor.

Price 7*d.* per form (inclusive of purchase tax). Postage 3*d.*

Prizes and Studentships

Price 2*s.* 6*d.* Postage 4*d.*

Tender, Form of, for use by Nominated Suppliers

Price 2*d.* per form. Postage 3*d.* 2*d.* per dozen (post free).

COMPETITIONS

Northern Ireland War Memorial Building. The Governors of The Council of the Northern Ireland War Memorial invite architects resident in Great Britain and Northern Ireland to submit designs for a Memorial Hall and offices, to be erected in Belfast, Northern Ireland.

Assessors: Mr. Harold A. Dod, M.A. [*F*], Mr. R. S. Wilshere, M.C., F.R.I.C.S. [*F*].

Premiums: £750, £500, £300.

Last day for submitting designs: 30 March 1957.

Last day for questions: 14 December 1956.

Conditions may be obtained from Captain W. H. Wilson, Hon. Secretary, The Council of the Northern Ireland War Memorial, 73 King Street, Belfast.

Deposit: £2 2*s*. 0*d*.

An applicant for the conditions must state his registration number or the number of the receipt issued to him by the Architects' Registration Council in respect of the admission fee.

Proposed Municipal Offices and Civic Hall, Carlisle. The Corporation of the City and County Borough of Carlisle invite architects registered under the Architects (Registration) Acts and resident in Great Britain, Northern Ireland or the Republic of Ireland to submit in competition designs for a new Assembly Hall and Municipal Offices to be erected in Carlisle.

Assessor: Professor W. B. Edwards, M.A., B.Arch., M.T.P.I. [*F*].

PREMIUMS

(*a*) Preliminary Stage. Six competitors will be selected to proceed to final stage. Each will receive the sum of £300. Last day for submitting designs, Thursday 31 January 1957.
(*b*) Final Stage. The author of the design placed first will receive £1,000. Last day for submitting designs, 1 July 1957.
Last day for questions, 27 October 1956.

Conditions may be obtained from the Town Clerk, 15 Fisher Street, Carlisle.

Deposit £2 2*s*. 0*d*.

An applicant for the conditions must state his registration number or the number of the receipt issued to him by the Architects' Registration Council in respect of the admission fee.

New Technical College Buildings, Paisley, Scotland. The Governors of the above College invite architects registered under the Architects (Registration) Acts and resident in Great Britain, Northern Ireland or the Republic of Ireland to submit in competition designs for new Technical College buildings in Paisley, Scotland.

Assessor: Professor R. Gardner-Medwin, M.T.P.I. [*F*].

Premiums: £1,500, £1,000, £500.

Last day for submitting designs: Noon on 27 March 1957.

Conditions may be obtained from Messrs. J. and A. Gardner, Clerks to the Governors, 3 County Place, Paisley, Renfrewshire.

Deposit: £2.

An applicant for the conditions must state his registration number or the number of the receipt issued to him by the Architects' Registration Council in respect of the admission fee.

New National Opera House at Bennelong Point, Sydney, Australia: International Competition. The Government of the State of New South Wales invites architects who are members of their respective architectural institutes in any country in the world to submit designs in competition for a proposed National Opera House, to be erected on Bennelong Point, Sydney, Australia.

Assessors: Professor H. I. Ashworth, M.A.(Arch.), F.R.A.I.A. [*F*], Sydney; Mr. Cobden Parkes, F.R.A.I.A. [*F*], Sydney; Dr. J. L. Martin, M.A. [*F*], London; Mr. Eero Saarinen, A.I.A., Michigan, U.S.A.

Premiums: £A5,000, £A2,000, £A1,000.

Last day for despatching designs: 3 December 1956.

Every intending competitor was required to register his name and address in writing with the Secretary of the Opera House Committee not later than 15 *March* 1956.

International Competition, Geneva. The Department of Public Works for the Republic and Canton of Geneva are promoting an International Contest of Ideas for the layout of the Place des Nations and of the Approach to the Secretariat of the Palais des Nations in Geneva. Assessors: M. Jean Dutoit, Prof. Sir Patrick Abercrombie [*F*], M. Eugène Beaudouin, M. Jacques Carlu, M. Arnold Hoechel, M. Giulio Minoletti, M. Werner Moser. The Assessors will work in consultation with representatives of the European Office of the United Nations, the City of Geneva, the Chief of Police of Geneva, the Secretary General of the Department of Public Works.

Premiums: 40,000 Swiss francs to be awarded to a maximum of 5 entries; 10,000 Swiss francs for the purchase of the premiated entry.

Last day for the despatch of entries: 6 p.m., 15 April 1957.

Conditions may be obtained on application to the Department of Public Works, 6 rue de l'Hôtel de Ville, Geneva.

Deposit: 50 Swiss francs, returnable if an entry is submitted.

The conditions of this competition have been approved by the I.U.A.

International Competition, Memorial to Enrico Fermi, Chicago, U.S.A. The Secretariat of the International Union of Architects have examined the published conditions of this competition and found them to be not in accordance with the standard regulations for International Competitions (R.I.B.A. Kalendar page 840). Member nations of the I.U.A. have accordingly been warned not to participate.

ALLIED SOCIETIES

CHANGES OF OFFICERS AND ADDRESSES

Devon and Cornwall Society of Architects, Truro Branch: The Hon. Secretary, Leslie Buxton [*A*], has changed his address to 'Vansett', Edgcumbe Road, St. Austell, Cornwall.

East Africa Institute of Architects, Uganda Chapter: Hon. Secretary, B. W. Bousted, P.O. Box 1141, Kampala, Uganda, East Africa.

South Eastern Society of Architects. Canterbury District Chapter. First Public Lecture 1956–57. The first public lecture 1956–57 was given at the School of Architecture, Canterbury College of Art, by Sir William Holford, P.P.T.P.I., F.I.L.A. [*F*], on 'St. Paul's in the City and Problems of Central Areas'. The audience of 111 included town planners, architects and members of the City Council.

Sir William explained the nature of the problem confronting the planner in the St. Paul's area. With the help of slides he showed how the area had grown and developed from mediaeval times until today.

Many of his slides were from photographs specially prepared to illustrate the particular difficulties of planning to show St. Paul's to the best advantage from close up and from very distant viewpoints such as are obtainable up and down the River Thames. He showed how comprehensive studies had been made to test the possibility of development to suit the wishes of those who thought that a monumental scheme of development comparable with that of St. Peter's was the proper one. He was able to show although every effort had been made to treat these proposals seriously it was self-evident that they would not work in the special circumstances which exist in the St. Paul's area, since the site of St. Paul's is on a hill and any widespread development tended to fall off the hill or to involve the developers in enormous cost for under-building.

Sir William then explained the scheme which he had himself evolved as that most suitable to guide future development. He reminded his audience of the practical considerations which had to be borne in mind—improvement of traffic facilities, provision of adequate office floor space in the immediate locality, arrangements for car parking for office users and for visitors, a comprehensive consideration of heating, bearing in mind that St. Paul's is now in a smokeless zone, etc. He showed with his last slides how a practical, realistic development, worthy of the cathedral and the prominence of the site, could be evolved along the lines of the proposals recently shown to the public and approved by the City Council.

In reply to questions Sir William said that the only uncertainties now were the attitude of the Minister himself, who must give final approval to the scheme, and the adverse effect which might be anticipated from the present credit squeeze. He believed that the scheme could only succeed if it were done as a whole and quickly. There would be no difficulty in raising the necessary money for the development itself, the cost to the community would be only that of compensation to those who had to be displaced for the improvement of roads and open spaces. For this a sum of about a million pounds would be required.

The vote of thanks was proposed by Mr. L. Hugh Wilson, O.B.E., A.M.T.P.I. [*A*], City Architect.

Stirling Society of Architects. Exhibition. The Education Authority of the County of Stirling and the Scottish Headquarters of the Ministry of Works organised a 'Stirlingshire Building Week' from 14 to 22 September, the purpose being to stimulate local interest in the work of the building and civil engineering industries and to further the recruitment of the right kind of apprentice or student.

The Stirling Society of Architects contributed a display entitled 'The Combined Operation', designed by Mr. W. H. Henry [*L*], President of the Society, and members of his office staff. The display showed the whole process of construction of a building, from plan stage onwards, by means of teamwork between architect, kindred professions and the building trades. A 'family tree' showed the relationship between the Stirling Society, the R.I.A.S. and the R.I.B.A.

GENERAL NOTES

R.I.B.A. Cricket Club *v.* Blue Circle Cricket Club. 11 September 1956.

R.I.B.A.	
J. G. Batty, c. Goddard b. Paddison	9
A. E. J. Morris, c. Goddard b. Paddison	0
A. Marlow, b. Paddison	4
D. J. Robinson, c. Jefferys b. Paddison	1
J. Seward, c. Hulme b. Brindley	5
G. Fyson, c. Gellatly b. Paddison	6
J. Kennedy-Hawkes, b. Brindley	6
D. A. Woodley, c. Hulme b. Brindley	22
C. G. Banfield, c. Hulme b. Jefferys	0
R. Case, c. Adamson b. Brindley	3
C. A. R. Norton, not out	4
Extras	1
	61

Paddison 5 for 17; Hulme 0 for 11, Brindley 4 for 13, Jefferys 1 for 19.

Blue Circle

D. Adamson, c. Norton b. Robinson	0
A. Clark, b. Robinson	9
R. Gellatly, not out	32
T. Patterson, c. Seward b. Robinson	6
J. Wright, not out	14
M. Brindley, A. Colpoys, G. A. Goddard, K. Hulme, H. G. Paddison, S. Jefferys — did not bat	
Extras	1
Total (for 3 wickets)	62

Robinson 3 for 23; Norton 0 for 12; Morris 0 for 7; Case 0 for 19.

Membership Lists

ELECTION: 9 OCTOBER 1956

The following candidates for membership were elected on 9 October 1956.

AS FELLOWS (25)

Ball: Alfred, Dip.T.P. (The Polytechnic) [*A* 1950].
Barnes: Thomas Scott [*A* 1926].
Beardshaw: John Edward [*A* 1939], Manchester.
Booth: Frank, Dipl.Arch., Dipl.T.P.(Leeds), A.M.T.P.I. [*A* 1940], Pontefract.
Conder: Neville, A.A.Dipl. [*A* 1947].
Edwards: Ernest John, F.R.I.C.S. [*A* 1940].
Farms: Kenneth William [*A* 1939].
Farms: Mrs. Margaret Frances [*A* 1938].
Fowler: William Roy [*A* 1938].
Glashan: William, Dip.Arch.(Abdn.) [*A* 1925], Inverness.
Harris: Maurice Henry [*A* 1947], Coventry.
Jackson: Ronald [*A* 1935].
Kaye: Sidney, Dip.Arch.(The Polytechnic), [*A* 1949].
Lacey: John Stephen, A.A.Dipl., A.M.T.P.I., [*A* 1939].
Quelch: Henry Darro [*A* 1949], Salisbury, Southern Rhodesia.
Rider: Lionel Sidney [*A* 1948], Bexhill-on-Sea.
Royle: Eric Vernon [*A* 1947], Nottingham.
Sheridan-Shedden: John Ronald, Dip.Arch. (Cardiff) [*A* 1937], Birmingham.
Stiles: Peter Huish Flamank [*A* 1945].
Strubbe: John A. [*A* 1949], Richmond, Surrey.
Townsend: Robert Leslie, A.A.Dipl. [*A* 1936], Bath.
Wheeler: John Martin, A.A.Dipl. [*A* 1940], Cambridge.
Womersley: John Lewis, A.M.T.P.I. [*A* 1934], Sheffield.
Woodcock: Percy [*A* 1935], Stafford.

and the following Licentiate who is qualified under Section IV, Clause 4 (*c*) (ii) of the Supplemental Charter of 1925:—

Hopcraft: John Edwin.

AS ASSOCIATES (51)

Aitken: Robert John, Dip.Arch.(Abdn.), Bridge of Don.
Aldersey-Williams: Arthur Grosvenor, B.Arch. (L'pool).
Allen: Denis John Wigram, A.S.T.C. (Arch.), Sydney, N.S.W., Australia.
Armstrong: William Muir, D.A.(Edin.), Corby.
Arthur: John Sinclair, Timaru, New Zealand.
Bagshaw: Laurence Ramage, Dip.Arch.(Sheffield).
Barber: John Peter.
Bate: Richard Cyril Kingsley Haigh Trail, Salisbury, Southern Rhodesia.
Bermingham: Patrick Joseph, Sandyford, Co. Dublin.
Bradley: John Francis, Dip.Arch.(Manchester), Bolton.
Bryan: Robert Ian, A.S.T.C.(Arch.)
Carpenter: Robert, Dip.Arch.(The Polytechnic).
Chibber: Tilak Raj, Dip.Arch.(Melbourne), Delhi, India.
Courtenay: Royston Rewell.
Crosby: Martin Prynne, B.Arch.(Rand), Johannesburg, S. Africa.
Dodgson: James Edwin, B.Arch.(L'pool), Burton-in-Lonsdale.
France: Alfred Victor, Georgetown, British Guiana.
Fraser: Donald Edmund, B.Arch.(C.T.), Salisbury, Southern Rhodesia.
Fulton: Alastair Macfie, Dip.Arch.(Abdn.), Buckie.
Giffen: Alfred George, D.A.(Edin.), Edinburgh.
Gordon: Max, M.A.(Cantab.), M.Arch.(Harvard).
Greenslade: Robert John, Dip.Arch.(Manchester), Church Stretton.
Grunberg: Roman, Dip.T.P.(London), Sanderstead.
Henson: Felton James, Dip.Arch.(Sheffield), Sidcup.
Hepworth: Brian, B.A.(Arch.)(Sheffield), York.
Heywood: Stanley Owen, B.A.(Arch.)(Sheffield), Warwick.
Hills: Donald William, Poole.
Horwitz: Edwin, B.A.Arch.(C.T.), Johannesburg, S. Africa.
Jack: Russell Callam, A.S.T.C.(Arch.), Sydney, N.S.W., Australia.
Jamieson: James Hugh Vernon, Dip.Arch. (Abdn.), Aberdeen.
Jobling: Edwin, A.A.Dipl., Epsom.
Kwok: Stanley Tun-li, A.A.Dipl., Hong Kong.
McLaughlin: Peter F., B.Arch.(N.U.I. Dublin), Dublin.
Mitchell: Ronald, D.A.(Dundee), Dundee.
Moy: Peter Roy, Dipl.Arch.(Northern Polytechnic), Ottawa, Ontario, Canada.
Murdoch: Denis Harwood Mackenzie, B.Arch. (C.T.), Worksop.
Osborne: Andrew Harold, Ilford.
Pacitti: Cosimo, Dip.Arch.(Abdn.), Aberdeen.
Plester: Murray Julian Gaffee, Dipl.Arch. (Oxford), Cheltenham.
Robertshaw: John Russell, Chertsey.
Russell: Barry Rivers, A.A.Dipl., Oxford.
Scattergood: Derek, Dip.Arch.(Sheffield), Chesterfield.
Torkington: Basil, Dip.Arch.(Manchester), Wythenshawe.
Trevithick: Morris Henry
Waddington: Samuel, Blackpool.
Watson: Henry Barnett Pont, Dip.Arch.(Abdn.), Aberdeen.
Westwood: Peter Alexander, B.Arch.(Rand), S.P.Dip.
Whittaker: Eric, Middleton.
Wilson: Blair Mansfield, B.Arch. (Queensland), Brisbane, Queensland, Australia.
Woolley: Kenneth Frank Charles, B.Arch. (Sydney), Sydney, N.S.W., Australia.
Yetton: Douglas Roy, B.Arch.(Rand), Kitwe, Northern Rhodesia.

AS LICENTIATES (47)

Aylward: John James Maurice, Dublin.
Bell: Thomas, Belfast.
Booth: Charles Ernest Thomas, Hereford.
Bucknell: Frank Thomas, Guildford.
Caton: Samuel Charles, Newcastle, Staffs.
Claypole: Bernard William Henry, Northampton.
Cripps: William Harold Ching, Oxford.
Donaldson: Kenneth Cecil, Weybridge.
Evans: David Thomas Daniel, Abergavenny.
Ferguson: James, Dumfries.
Gratrix: Henry Holmwood, Swansea.
Harrington: Frank Harvey, Nottingham.
Haybittle: Ernest Joseph.
Hayes: Frank, Nottingham.
Hendy: Arnold F., Dublin.
Henry: Geoffrey Cecil Francis, Dublin.
Hunt: Cecil Albert.
Irving: Thomas Kerr, Stranraer.
Jones: Jack Osborne Wills.
Kennedy: Thomas Stanley Aitchison, Edinburgh.
Latter: William Frederick George, Worthing.
Lees: Isaac Percy Dagley, Newmarket.
Leigh: Herbert Gordon, Hemel Hempstead.
McAndrew: William, Dunecht.
McEwan-Waghorn: Charles Ewan, Kirkcaldy.
McGibbon: David, Lanark.
Marsden: Harold, Newhaven.
Matthews: John Graham, Newark-on-Trent.
Ord: Austin, South Shields.
Painter: Alan, Birmingham.
Pentland: Thomas Parkhill, Belfast.
Pitt: Henry Stapleton.
Powell: Vivian Gough, A.M.I.C.E., Cwmbran.
Richards: John Melville, Great Yarmouth.
Royle: Harold, Preston.
Salter: Donald William, Bristol.
Scanlan: William Henry, F.R.I.C.S.
Schofield: Harold Dudley, West Bridgford.
Shrimpton: Stuart Norman, T.D., Ludlow.
Smith: Frank John, F.R.I.C.S.
Soper: John.
Tonge: William, Reading.
Varndell: Albert James, Benfleet.
Ventress: Herbert Harvey Crowther, Poole.
Warren: James Herbert, Bury St. Edmunds.
Wicks: Charles Alec Gordon, B.E.M., Reigate.
Williams: Herbert R., Southport.

ELECTION: 6 NOVEMBER 1956

An election of candidates for membership will take place on 6 November 1956. The names and addresses of the candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Saturday 3 November 1956.

The names following the applicant's address are those of his proposers.

AS FELLOWS (4)

Williams: Hugh Owen, Dip.Arch.(Cardiff) [*A* 1946], Welsh Office, Ministry of Housing and Local Government, Cathays Park, Cardiff; Silverbrook, Pentyrch, Cardiff. John Hughes, J. H. Forshaw, Lewis John.

and the following Licentiates who have passed the qualifying Examination:—

Craig: John Stone, The British Aluminium Co. Ltd., Architectural Department, 9 Rosebery Crescent, Edinburgh; 75 Manse Road, Newmains, Wishaw, Lanarkshire. Esme Gordon, W. G. Dey, J. R. McKay.

Murphy: Lawrence Patrick, Ministry of Works, Abell House, Westminster, S.W.1; 64 Marksbury Avenue, Richmond, Surrey. P. M. Andrews, A. M. Gear, E. R. Taylor.

Russell: Vernon Fletcher, Roding House, Abridge, Essex. P. G. H. Fawcett, Philip Powell, Hidalgo Moya.

AS ASSOCIATES (33)

The name of a school, or schools, after a candidate's name indicates the passing of a recognised course.

Alexander: Wynn Garbet, B.Arch.(Wales) (Welsh Sch. of Arch.: The Tech. Coll., Cardiff), Pantycelyn, Crynant, Neath, Glam. Lewis John, C. F. Jones, Dr. T. A. Lloyd.

Bamford: Derek Morton, Dip.Arch.(Nottm. (Nottingham Sch. of Arch.), 11A Lenton Road,

The Park, Nottingham. Ernest Frear and applying for nomination by the Council under Bye-law 3(*d*).

Benton: Harold Frederick, (Final), 17 Larkfield Avenue, Gillingham, Kent. A. G. MacDonald, G. C. Wilson, C. Worthington.

Brownlee: Brian Thomas, B.Arch.(C.T.) (Passed a qualifying exam. approved by the I.S.A.A.), c/o South Africa House, Trafalgar Square, W.C.2. Prof. L. W. T. White and applying for nomination by the Council under Bye-law 3(*d*).

Burchill: John George, (Special Final), 18 Prestwood Avenue, Kenton, Harrow, Middlesex. T. E. Scott, A. V. Banks, C. E. W. Boreham.

Cameron: Kenneth James, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 3 Glendevon Park, Edinburgh, 12. J. R. McKay, T. W. Marwick, W. I. Thomson.

Cavell: Martin Henry, (Final), 377 Singlewell Road, Gravesend, Kent. R. Vaughan, Alan Devereux, E. L. W. Davies.

Collyer: James Henry, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 21 Merstowe Close, Acocks Green, Birmingham, 27. A. Douglas Jones, K. A. Lloyd, G. A. G. Miller.

Cooper: Kenneth, (Final), 12 Carlton Road, Ainsdale, Southport. S. F. McLauchlan, S. McLauchlan, A. Douglas Jones.

Diaz: Amador, (Special Final), 112 Oxford Avenue, Southampton. Applying for nomination by the Council under Bye-law 3(*d*).

England: Maurice, (Special Final), "Haywards," Lower Kirklington Road, Southwell, Notts. R. W. Cooper, C. F. W. Haseldine, J. W. M. Dudding.

Entwistle: Geoffrey, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 10 Augustus Road, Edgbaston, Birmingham, 15. A. Douglas Jones, T. M. Ashford, D. A. Goldfinch.

Epstein: Gabriel, A.A.Dipl.(Arch. Assoc. (London): Sch. of Arch.), 4 Russell Road, W.14. D. L. Bridgwater, R. F. Jordan, Bryan Westwood.

Ferguson: William, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 96 Dalkeith Road, Edinburgh 9. D. D. Jack, A. C. S. Auld, J. Holt.

Gregory: David George Robert, (Final), 1 Riversdale Road, Collier Row, Romford, Essex. E. D. Mills, F. C. Webster, I. G. Smith.

Griffiths: Alan David, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 70 Water Orton Road, Castle Bromwich, Warwickshire. A. Douglas Jones, Arthur Ling, R. Hellberg.

Haley: Edward Anthony, (Final), 95A Hill Lane, Southampton. J. B. Brandt, B. H. Dale, E. M. Galloway.

Jack: Neil McLean, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 15 Douglas Crescent, Edinburgh, 12. Gordon Tait, A. C. S. Auld, Frank Wood.

Lewis: John Michael, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 164 Knightlow Road, Harborne, Birmingham, 17. A. Douglas Jones, H. C. Bloomer, W. N. Hawkes.

Mark: Frederick, (Final), 70 Cotham Road, Bristol, 6. J. N. Meredith, Kenneth Nealon, T. H. B. Burrough.

Maskill: (Mrs.) Elizabeth Anne, Dip.Arch.(Sheffield) (Univ. of Sheffield: Dept. of Arch.), 23 Watson Avenue, Mansfield, Notts. Prof. Stephen Welsh, H. B. Leighton, G. S. Harrison.

Moizer: Jack David, Dip.Arch.(Birm.) (Birmingham Sch. of Arch.), 9 Melton Road, West Bridgford, Nottingham. A. Douglas Jones, T. M. Ashford, E. Frear.

Mooney: Matthew Brian, B.A.(Manchester) (Victoria Univ., Manchester: Sch. of Arch.). 75 Church Road, Northenden, Manchester, 22. Dr. W. A. Singleton, F. M. Reynolds, E. S. Benson.

Paton: Thomas, D.A.(Edin.) (Edinburgh Coll. of Art: Sch. of Arch.), 84 Townhill Road, Dunfermline, Fife. D. D. Jack, A. C. S. Auld, James Shearer.

Patterson: Dennis, (Special Final), 50 Boden Road, Hall Green, Birmingham, 28. H. W. Weedon, A. L. Hall, L. J. Multon.

Phillips: Roland Oliver (Final), 12 Medway Road, Gillingham, Kent. Herbert Kenchington, K. E. Black, D. L. Lasdun.

Smith: Michael, B.Arch.(Rand) (Passed a qualifying exam. approved by the I.S.A.A.). 109 Hampstead Way, N.W.11. Applying for nomination by the Council under Bye-law 3(*d*).

Torok: Gyula Laszlo, (Special Final), 32 Abercorn Place, St. John's Wood, N.W.8. W. W. Todd, Vivian Pilley, H. F. Robinson.

Walford: Neil Evan, (Final), 11 Port Hall Road, Brighton, Sussex. K. E. Black, L. M. Gotch, Arthur Wilkinson.

Walsh: Leslie Albert, (Special Final), 35 Woodhouse Road, Compton, Wolverhampton. A. E. Miller, M. H. Forward, A. G. Chant.

Wastell: Hubert Hedley, D.F.C. (Special Final), 8 Westbourne Road, Sketty, Swansea. Sir Percy Thomas, Dr. T. A. Lloyd, C. F. Jones.

Willman: John Angus, (Special Final), 70 Heathleigh Road, Kings Norton, Birmingham, 30. H. W. Weedon, A. L. Hall, R. L. Stone.

Wilson: Colin Renshaw, Dipl.Arch.(L'pool) (Liverpool Sch. of Arch., Univ. of Liverpool), 2 Ashfield Road, Liverpool, 17. Prof. L. B. Budden, R. R. Young, Prof. R. Gardner-Medwin.

ELECTION: 5 FEBRUARY 1957

An election of candidates for membership will take place on 5 February 1957. The names and addresses of the overseas candidates, with the names of their proposers, are herewith published for the information of members. Notice of any objection or any other communication respecting them must be sent to the Secretary, R.I.B.A., not later than Wednesday 16 January 1957.

The names following the applicant's address are those of his proposers.

AS ASSOCIATES (16)

Abbott: Clark Warner, B.Arch.(McGill) (McGill Univ. Montreal, Canada: Sch. of Arch.), Baywinds, Devonshire, Bermuda. V. D. Bouchard, W. R. Onions and applying for nomination by the Council under Bye-law 3(*d*).

Berlowitz: Manfred, B.Arch.(C.T.) (Passed a qualifying exam. approved by the I.S.A.A.), P.O. Box 146, Bulawayo, S. Rhodesia. Prof. L. W. T. White, O. Pryce Lewis, J. R. Hobson.

Canterbury: Robert, (Passed a qualifying exam. approved by the R.A.I.A.), Mayfair Arcade, Lonsdale Street, Dandenong, Victoria, Australia. Prof. B. B. Lewis, Mrs. Hilary Lewis, P. H. Meldrum.

Charlton: Ian Douglas, B.Arch.(Queensland) (Passed a qualifying exam. approved by the R.A.I.A.), 23 Leichhardt Street, Brisbane, Queensland, Australia. Prof. R. P. Cummings, T. B. F. Gargett, C. Fulton.

Conrad: William Arnold Henry, B.Arch. (Queensland) (Passed a qualifying exam. approved by the R.A.I.A.), c/o Messrs. A. H. Conrad & T. B. F. Gargett, Needham House 40 Leichhardt Street, Brisbane, Queensland, Australia. T. B. F. Gargett, Prof. R. P. Cummings, C. Fulton.

Fawcett: John William, (Passed a qualifying exam. approved by the R.A.I.A.), 10 Ward Street, North Adelaide, South Australia. Gavin Walkley, F. K. Milne, L. Laybourne-Smith.

Freeman: Robert Glasgow, A.S.T.C. (Arch. (Passed a qualifying exam. approved by the R.A.I.A.), c/o Messrs. Stephenson and Turner, Romilly House, North Terrace, Adelaide, South Australia. Sir Arthur Stephenson, Harry Winbush, Prof. B. B. Lewis.

Godhard: Peter Alfred, B.Arch.(Sydney) (Passed a qualifying exam. approved by the R.A.I.A.), 17 Wahroonga Avenue, Wahroonga, N.S.W., Australia. Prof. H. I. Ashworth, Prof. Denis Winston, E. L. Thompson.

Hotchin: George Benjamin, Dip.Arch. (Auck. N.Z.) (Passed a qualifying exam. approved by the N.Z.I.A.), c/o Auckland Electric Power Board, Auckland, New Zealand. Prof. C. R. Knight, Prof. A. C. Light and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(*a*).

Prabhawalkar: Anant Ramchandra, (Final), Junior Town Planner, Senior Architect's Office, Capital Project, Chandigarh, Punjab, India. M. K. Jadhav, S. H. Parelkar, H. N. Dallas.

Ryan: Shane Virgil, (Passed a qualifying exam. approved by the R.A.I.A.), 21 Dowse Street, Paddington, Brisbane, Queensland, Australia. Prof. R. P. Cummings, E. J. A. Weller, C. Fulton.

Smith: Graham Lawrence, B.Arch.(Auck., N.Z.) (Passed a qualifying exam. approved by the N.Z.I.A.), c/o Box 65, Brunei Town, Brunei, Borneo. Prof. C. R. Knight, Prof. A. C. Light and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(*a*).

Smith: Peter Cowie, (Special Final), 72 Baines Avenue, Salisbury, Southern Rhodesia. C. A. Knight, J. R. Hobson, W. F. Hendry.

Smith: Travis Jarvie, Dip.Arch.(Auck., N.Z.) (Passed a qualifying exam. approved by the N.Z.I.A.), P.O. Box 407, Tutanekai Street, Rotorua, New Zealand. J. I. King and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(*a*).

Tudor: Graham Dale, B.Arch.(Melbourne) (Passed a qualifying exam. approved by the R.A.I.A.), 15 Byron Street, North Brighton, S.5., Victoria, Australia. R. S. Demaine, Prof. B. B. Lewis, Mrs. Hilary Lewis.

Warr: Roger John Churchill, Dip.Arch.(Auck., N.Z.) (Passed a qualifying exam. approved by the N.Z.I.A.), Architectural Division, Ministry of Works, Christchurch, New Zealand. Prof. C. R. Knight, Prof. A. C. Light and the President and Hon. Secretary of the N.Z.I.A. under Bye-law 3(*a*).

Obituaries

Michael George Francis Ventris, O.B.E. [*A*], was killed in a motor accident on 6 September at the age of 34. The profession has thus been deprived tragically of one of its most promising younger members. Mr. Robert Furneaux Jordan [*F*] writes:

'Michael Ventris was educated first in Switzerland and then at Stowe. In 1940 he went to the A.A. School. He joined the R.A.F. in 1942, serving as a navigator. Returning to the A.A. in 1946 he obtained an Honours Diploma and was awarded both the R.I.B.A. Henry Jarvis Scholarship and the Henry Florence

Scholarship. In 1948 he went to the School of Planning in Gordon Square and then joined the Ministry of Education Development Group, working on the design of the Ministry's experimental school at Wokingham and on their well-known bulletins. In 1941 he had married Lois Knox-Niven, also an A.A. student. They had two children. They lived first in a Highpoint flat but in 1953 designed their own house at North End, Hampstead. In the same year Michael Ventris finally deciphered Minoan Linear Script B—the earliest written European language. In 1954 he received an Honorary Doctorate at the University of Upsala and was made an Honorary Research Associate at University College, London. In 1955 he received the O.B.E. At the beginning of this year he received the first ARCHITECTS' JOURNAL Research Fellowship, his subject being "Information for the Architect". This work was cut short by his untimely death.

'Such is the bare outline of an unusual, as well as unusually brilliant, career—the bare list of achievements and honours, some of which he managed to hide even from his friends. His brilliance more than once touched the point of genius; his modesty was excessive since it often prevented him from attempting things he could have done so well but which he felt he could not complete to his own high standard. This standard was that of perfectionism—perfection of method, technique, analysis, draftsmanship, typography, design. It was, in a curious way, the one link between all his varied activities, the one thing they all had in common. We know little of his work in the R.A.F., but the whole apparatus of navigation must have appealed to him; he would have made a superb cartographer and did so more than once. But then all his work bore that stamp of precise format. This did not mean merely the tidy page; it meant the clarification of facts by a considered and beautiful arrangement of them. His notebooks and analytical drawings, as such, have seldom been equalled. If the route to modern design is by way of a refined analysis of the problem and then of all its possible solutions, then Michael Ventris would one day have been a very great architect; not least because at the end of the analytical process, he was never averse to the sudden intuitive perception that gives the answer. It was this combination of analysis and perception, together with this precision of form, that he applied equally to architecture, philology and archaeology.

'As well as being a first-class classical scholar he spoke almost every European language. Once in a country he seemed to learn the language in a few weeks. Visiting Sweden with fellow-students he ended a short holiday by pulling off the coveted job in a Swedish office, mainly because he had by then mastered Swedish. Before his first visit to Greece he turned his classical Greek into modern Greek by an analysis of newspapers and magazines. His approach to language was the intellectual and philological one, but he soon used the language in a practical way.

'As a schoolboy he had in 1935 heard a lecture by Sir Arthur Evans on Knossos and was fascinated by the problem of an undecipherable script. While still at school he published his first essay and was recognised as a serious student of Minoan, but it was not until he left the A.A. that he was able to concentrate upon the hundreds of tablets from Knossos and Messenia. It was at that time uncertain whether Minoan was an Indo-European language at all, still less an Hellenic one; Michael Ventris knew that, however elaborate his decoding methods, he might be attempting the impossible in trying to transliterate unknown hieroglyphs into an unknown language. He has described ("King Nestor's Four Handled Cups" in ARCHAEOLOGY, Vol. 7, No. 1, pp. 15–21) how he counted the occurrences of the 88 spelling signs, how he checked their situation on the tablets till it seemed that some might be names of men, cities or commodities, and how an analysis of case endings enabled him to construct declension patterns, and so on . . . until the dramatic moment in May 1952 when he was toying with the value of KO, trying it against KO-NO-SO (Knossos) and KOR-WOS (Greek for "boy"). "I was amazed at the result," he wrote, "in a few days a series of the values for the syllabary fell into place which gave Greek forms for the Greek words . . . in terms of Homeric Greek grammar".

'Here, then, was a "Greek" language seven hundred years older than Greek, used both in Crete and on the mainland. Not only the Homeric heroes but the more ancient lords of Mycenae and of Knossos had, we now know, been Greeks. John Chadwick of Cambridge, who collaborated in the development and publication of the results (JOURNAL OF HELLENIC STUDIES, No. 73, 1953, pp. 84–103) says that Ventris's solution "opened the way to a complete reappraisal of early Greek history. The first chapters of the history books are already being written". There may be little Minoan literature but the names of Athena, Apollo and Poseidon appear on the tablets of a people who, according to Evans, had worshipped only a Mother Goddess, and were not Greek at all. It was not easy for the experts, baffled for fifty years, to accept so startling a solution, but the issue is now beyond controversy and as one of Michael Ventris's friends writes in THE TIMES will have "effects that will reach far beyond the bounds of classical scholarship". Another contributor writes that "his great discovery has made his name immortal". Outside the heroism of war and exploration, immortality at the age of 34 is rare indeed.

'Careful analysis, precision and then—but only then—the intuitive grasp of the answer . . . to one who is familar with Michael Ventris's technique as applied to a student thesis, to a modern school, a house or the mastery of a language, it seems strange to see its application to an abstruse problem of archaeology. But it worked when orthodox methods had failed.

'Such a precise mind, added to such quiet diffidence, may suggest a cold character. This was not so. He was an artist. His own house was, it is true, a very "pure" piece of design in an Anglo-Danish idiom, but it was full of lovely detail and was as colourful and friendly in its architecture as it was in its hospitality. One remembers, for instance, among many things, the very careful placing of the windows to frame in the treetops and foliage patterns of a delectable site. He was not only an artist, he was a very human person. His circle was not large but to those who knew him well he was a warm friend, modest, generous and witty.

'Finally, in the R.I.B.A. JOURNAL it may be said that his death was a very real loss to architecture. The world will remember his great archaeological achievement, but for him it was really a side-line, usually carried out concurrently with other work. He had already come back to architecture and almost certainly had ahead of him a career upon which it is fascinating to speculate. Some of us will mourn him as a friend but we shall none of us ever know what our art may have lost.'

Sidney Albert Bettesworth [*L*] died on 21 May, aged 54.

Mr. Bettesworth's principal work was Newspaper House, Kilburn Lane, N.W.9, for the North Western Printing and Publishing Association Ltd.

Hans Sigmund Jaretzki [*F*] died on 16 March, aged 66.

Mr. Jaretzki was born in Berlin and studied at the universities of Berlin and Munich. He began personal practice in Germany in 1918 and built factories, banks and houses, besides being responsible for large municipal housing schemes and office buildings and a cinema. In 1933 he was expelled from the B.D.A. by the Nazis and came to England, settling in Hampstead. Here he built houses in Hampstead, Chelsea, Kensington, Wembley and the Midlands, flats in Sutton, factories in Neath and Wembley Park and shops and showrooms in the West End of London. Since the war he had been engaged on designing two synagogues —one at Edgware and the other at Wembley.

Mr. Jaretzki's hobbies were music and art.

His practice is carried on by Bernard H. Dale & Partners [*F*], 20 Dorset Square, N.W.1.

Hamilton More Nisbett [*L*] died on 24 December 1955, aged 87.

Mr. Nisbett served his articles and practised in Edinburgh.

Among his known architectural works are the decoration of the Lady Chapel, St. Michael's Church, Hill Square, Edinburgh, the war memorial for St. Roque's Church, Dundee, and the county police station, Balerno, Midlothian. He designed the wrought iron gate and railings, Western Avenue, The Drum, Gilmerton, Edinburgh, and made many years ago detailed drawings of the painted ceiling of the Long Gallery of Pinkie House, Musselburgh, Midlothian, of which the Ministry of Works recently undertook the restoration.

Mr. Nisbett was the author of several books —*Drum of the Somervilles* and *Oxenfoord and its Owners*, both published by William Brown of Edinburgh, and *Cairnhill*, published by the Moray Press, Edinburgh.

Members' Column

This column is reserved for notices of changes of address, partnerships vacant or wanted, practices for sale or wanted, office accommodation, and personal notices other than of posts wanted as salaried assistants for which the Institute's Employment Register is maintained.

Correction

Mr. Oliver Evans Palmer [*A*] is continuing the practice of his late father, Mr. Philip Evans Palmer [*A*], at Colletts Alley, Middle Street, Horsham, Sussex (Horsham 3029).

We very much regret the error which appeared in Members' Column for September, when Mr. Palmer's name was printed as 'Taylor'.

APPOINTMENTS

Mr. H. G. Eisner [*A*] has resigned his former appointment as Assistant Architect to the Middlesbrough Education Committee and has become Senior Assistant Architect, Borough of Watford. His address is now 263 Sheepcot Lane, Woodside, Watford, Herts.

Mr. R. R. Milton-Hine [*A*] has resigned from the partnership of Eric Cole & Partners, Cirencester, and is taking up an appointment with the Architect-in-Chief's Department, South Australian Government, Victoria Square, Adelaide, South Australia.

Mr. M. D. Pocock [*A*], recently Assistant Architect with the Berkshire County Council, has taken up an appointment as Architect, Housing Authority, Barbados, British West Indies.

PRACTICES AND PARTNERSHIPS

Messrs. Grenfell Baines & Hargreaves [*AA*] have opened a new office at 423 Oxford Road, Manchester 13 (ARD 6551). **Mr. A. Whitehead** [*A*] has become an Associate in the firm and is in charge of the new office, where he will be pleased to receive trade catalogues, etc. The new address is in addition to the present offices at 12–24 Guildhall Street, Preston, 58 Topping Street, Blackpool, and 123 Victoria Road, Darlington.

Mr. R. Vyvyan Board [*A*] has taken into partnership **Mr. G. E. Harvey** [*A*] in addition to Mr. R. M. James, A.R.I.C.S., who joined him earlier in the year. The firm practises as **Vyvyan Board & Partners, Architects and Surveyors.**

Messrs. Brunton, Baden Hellard & Partners [*AA*] announce that Mr. Raymond J. Playle, A.R.I.C.S., A.I.Arb., is joining the Polycon Group of chartered architects and consultants and will act as a member of the design team at their Lee office, 96 Eltham Road, S.E.12 (Lee Green 0228).

Mr. Alfred G. Church, M.T.P.I. [*F*] has retired from Messrs. Swan and Maclaren of Singapore and has begun private practice at Park Chambers, Wadebridge, Cornwall. He will be glad to receive trade catalogues, etc.

Mr. J. F. Davies [*A*] and **Mr. H. G. Clinch** [*A*] have entered into partnership and are practising at 30 Percy Street, London, W.1. (MUSeum 1377).

Mr. G. H. Foggitt, A.R.C.A. [*F*] has taken into partnership **Mr. R. T. Clough** [*A*]. The firm will continue under the existing name of **Gribbon & Foggitt,** 3 Park Place, Leeds 1.

Messrs. Matley, Brotherton & Mills (Mr. A. H. Brotherton [*L*]) have opened a branch office at 5 School Road, Sale (SALe 8164), where they will be pleased to receive trade catalogues, etc.

Messrs. Mence & Moore [*A/L*], having now reopened their office at 71 Murray Street, Georgetown, British Guiana, will be pleased to receive trade catalogues, etc.

Messrs. Thomas Mitchell & Partners [*AA*], of 20 Bedford Square, London, W.C.1, have taken into partnership **Mr. Robert Stille,** M.C. [*A*], who has been a member of their staff for several years. The name and address of the firm remain unchanged.

Messrs. Moir & Bateman [*F/A*] have incorporated in their practice the firm of S. Butterworth and Duncan of Baillie Street, Rochdale, and their practice will in future be carried on as **Moir and Bateman, Chartered Architects (incorporating S. Butterworth and Duncan)** at their existing address of Prudential Buildings, South Parade, Rochdale.

Mr. Kenneth L. S. Murdoch [*A*] has begun practice at High Street, Newport-on-Tay, Scotland, and will welcome trade literature, samples, etc.

Mr. John Nowell Parr [*F*] and **Mr. Reginald Paul Shannon** [*A*] have dissolved the partnership formerly carried on under the name of Nowell Parr & Son owing to the ill health of Mr. Parr. The practice will be continued by Mr. Shannon under the old name of **Nowell Parr & Son** at 97 Old Brompton Road, London, S.W.7.

Mr. Colin Rowntree [*F*] and **Mr. G. L. Thompson** [*F*] have by mutual consent dissolved their partnership, carried on under the name of Rowntree and Thompson. Mr. Rowntree will continue to practise under his own name at 120 the Mount, York, and Mr. Thompson under his own name at 22 Park Street, Selby, as previously.

Mr. MacLeod Wallace [*A*] has taken into partnership **Mr. John Barron Morton** [*A*] and has opened a branch office at No. 31 Carfax, Horsham (Horsham 3444), where Mr. Morton will be pleased to receive trade catalogues, etc.

Mr. J. R. Watson [*A*] has taken into partnership **Mr. P. N. R. Crowder** [*A*] and the practice will continue at P.O. Box 12021, Nairobi, Kenya, East Africa, under the style of **Watson & Crowder.**

Messrs. Watson, Salmond & Gray [*F/A*] have taken into partnership **Mr. Robert W. K. C. Rogerson** [*A*], formerly in practice at 121 Bath Street, Glasgow, C.2. The practice will continue under the name Watson, Salmond & Gray with addresses at 111 Union Street, Glasgow, C.1 (CENtral 3347–8) and 14 North Audley Street, Grosvenor Square, London, W.1 (MAYfair 6036).

CHANGES OF ADDRESS

Mr. J. Nelson Clark [*A*] has changed his address to 9 Friars Road, Ipswich, Suffolk. The telephone number remains as before (Ipswich 55567).

Mr. Edward J. W. Curtis [*A*] has moved to 9 Beacon Way, Rickmansworth, Herts. (Rickmansworth 2414), where he will be pleased to receive trade catalogues, etc. Representatives by appointment only.

Mr. D. A. Hogben [*A*] has changed his address to 'Corroy', Torquay Road, Foxrock, Co. Dublin.

Mr. H. M. Kanhere [*A*] now wishes all correspondence addressed to him as Assistant Architect, P.W.D. Secretariat Building, Flora Fountain, Bombay 1, India.

The address of **Mr. D. J. Middlebrook** [*A*] is now Box 187, Woods Hole, Mass., U.S.A.

Mr. G. Clayton Smith [*A*] and **Mr. W. Ormondroyd** [*A*], practising as **Messrs. G. Clayton Smith,** have changed their address to 28 Old Station Road, Newmarket, Suffolk. The telephone number remains unchanged (Newmarket 2393).

Mr. F. W. Stephens [*A*] has changed his address to c/o 15A Constant Spring Road, Halfway Tree P.O., St. Andrew, Jamaica, British West Indies.

PRACTICES AND PARTNERSHIPS WANTED AND AVAILABLE

Associate, 37, varied experience, seeks partnership or position leading thereto in London or up to 30 miles west. Some capital available. Box 79, c/o Secretary, R.I.B.A.

Well-established practice in north-west Lancs. has immediate opening for qualified Associate of substantial experience, with view to partnership. Box 80, c/o Secretary, R.I.B.A.

Architects with old-established practice in Sheffield require qualified assistant with view to partnership. Box 81, c/o Secretary, R.I.B.A.

Experienced Associate requires practice or partnership, preferably within 60 or 70 miles of London. Car owner. At present practising in own small fully-equipped London office. Adequate capital available. Box 83, c/o Secretary, R.I.B.A.

Architect's practice for sale, Northumberland. Present practitioner would continue to participate for a period to conclude contracts and introduce clients. Strict confidence. Box 86, c/o Secretary, R.I.B.A.

Fellow with over 20 years' wide experience, academically trained in both classical and contemporary design (5 years studio lecturer on design), own practice temporarily dormant but willing to merge potential contracts, seeks partnership or position with prospects thereof with London, Brighton or south coast firm of standing. Some capital available. Box 87, c/o Secretary, R.I.B.A.

Associate, 32, requires partnership or responsible position leading thereto in Liverpool, Merseyside area. Qualifications: Dipl. Arch. (distinction) (L'pool), Dip. C.D., A.M.T.P.I., seven years' varied experience in private practice coupled with short period local government work. Part-time lecturer in design and construction. Some capital available. Box 88, c/o Secretary, R.I.B.A.

Associate, A.A. Dip., A.M.T.P.I., age 40, wishing to leave present east coast practice for personal (family health) reasons, seeks partnership or senior position leading thereto in practice with progressive outlook in Bucks Berks or Oxfordshire. Wide ten-year experience as country principal. Contacts and capital available for right opportunity. Box 89, c/o Secretary, R.I.B.A.

Associate, 34, with valuable experience and at present senior assistant dealing with all aspects of work in large London practice, desires position leading to full responsibility and active partnership in a practice in any part of England. Some capital available. Box 90, c/o Secretary, R.I.B.A.

Junior partnership offered in leading architect's practice in West End of London, offering excellent opportunities for suitable applicant. Write giving full particulars of background, education, professional qualifications and experience. Capital purchase essential. Box 91, c/o Secretary R.I.B.A.

WANTED AND FOR SALE

Wanted. Surveying equipment. Dumpy level, staff, etc. Please state price required. Box 82, c/o Secretary, R.I.B.A.

For sale. Drawing desk, oak, one long drawer, two side drawers. Cheap for quick clearance. R.I.B.A. JOURNAL, December 1946 to date, a few copies missing. To be had for the removal. Wembley district. Box 85, c/o Secretary, R.I.B.A.

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